ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER

ESTABLISHED 1872

Vol. CXLV. No. 3748

23rd SEPTEMBER, 1949

Managerial Grades

FUNCTIONS AND SALARIES

WHEN a large part of the electricity supply industry was in municipal hands the chief electrical engineers of the undertakings banded together to form the Associated Municipal Electrical Engineers (A.M.E.E.) and after a long struggle secured recognition. A joint committee for the negotiation of salaries was set up and the "Walker Scale" was generally adopted.

With the nationalization of electricity supply municipal electrical engineers disappeared, as such, but by a stroke of heavy-handed ingenuity a new name was devised to fit the old initials—the Association of Managerial Electrical Executives. For the members of this still nebulous organization the British Electricity Authority proposes to set up a fourth negotiating body (there are already joint councils of the manual workers, clerical grades and technical staffs), but here it has fallen foul of the Electrical Power Engineers' Association.

Differing Views on Demarcation

The E.P.E.A. insists that before negotiating machinery is set up a decision should be made upon the line of demarcation. Its own view is that the division should be functional, which seems to be logical; i.e., "managerial executives" should be managers. When the industry was divided into self-contained units this was practicable. Each undertaking had one manager whether it was as big as Birmingham's or as small as that of a quiet country town. But in a huge vertical organization who are the managers and who the managed?

Faced with this problem the B.E.A. is attempting to introduce a simple solution. It is that all those receiving the salaries above a certain amount should be regarded as managerial grades. But this is too simple to be good—if the idea of "management" is persisted in. Salaries are broadly related to responsibility and seniority. A man may be responsible and senior, with a commensurate salary, but still not be a manager. Another with less responsibility and a lower salary may bear this appellation.

Senior Staff Union

In the past, says the E.P.E.A., it acquiesced in the formation of the A.M.E.E. as a matter of convenience in negotiation. On the same ground it agreed to carry over the principle of "convenience" to enable a separate joint council to be formed of the "genuine" managerial grades, although it is very doubtful whether the parties could agree upon a definition of this term. The Association now objects that the B.E.A. is attempting to create a senior staff union which can secure members only at the expense of long-established unions.

The matter is further complicated by the intervention of the National Association of Local Government Officers which is now represented on the staff side of one of the existing joint councils and also has members in the higher circles of the industry.

This makes it difficult for the higher grades to be dealt with by the joint councils already established and seems to necessitate a separate arrangement. While the B.E.A.'s demarcation-by-salary proposal may be an unsatisfactory way out of the dilemma it is difficult to see how else the matter can be handled. But it may be said that if the dividing line is settled on a salary and not a functional basis the need for a separate association for the senior staffs is not so apparent.

DEVALUATION

MUCH uncertainty is cleared away by the reduction of the dollar value of the pound sterling but much still remains. Until other countries have made their decisions it cannot be seen how the electrical industry's raw material supplies will be affected or how much more it will have to export to maintain the present sterling values. The Chancellor of the Exchequer in his broadcast last Sunday said: "We shall have to moderate the rate of our capital development." It is to be hoped that the Government will not repeat the mistake of curtailing power station construction at a time when more power than ever will be needed. He also referred to economy in Government expenditure. Here he opened up real possibilities.

CANADIAN REQUIREMENTS

THE possibility of setting up a system of testing and approval on this side of the Atlantic for intended electrical exports to Canada was tentatively explored by Mr. D. M. Buist while he was with the Engineering Trade Mission to Canada, and now more definite steps are to be taken in an endeavour to secure an early decision on the subject. Details of the delegation which is to visit Canada next month are given in this issue and a quick response should be made by interested manufacturers to the appeal for details of their experiences in supplying electrical equipment to Canada.

ENGINEERING WAGES

ALTHOUGH at the recent Bridlington Conference the president of the Amalgamated Engineering Union supported the General Council of the T.U.C. in its attitude on the subject of wage increases, his union is now a party to the demand for a rise which would cost the engineering and shipbuilding industries something like £100 million a year. Mr. Tanner seems to have been expressing his personal views, for the National Council of the A.E.U. approved the demand last June and the Union's journal, in reporting the Bridlington meeting, says that the application or disregard of the policy of the T.U.C. General Council is the responsibility of the individual unions. If this is so, too much importance seems to have been attached to the Council's pronouncements on prices, profits and wages which apparently are regarded by the constituent unions merely as unwelcome advice.

MANUAL WORKERS' PENSIONS

AN impression was given by some speakers at the Bridlington Conference of the T.U.C. that at present no manual workers in nationalized industries are in pension schemes. This is not quite true as Mr. F. Foulkes, president of the Electrical Trades Union, explained. Actually quite a substantial proportion of electricity supply employees here are in pension schemes taken over from their former employers. The extension of such schemes to the rest of the manual workers in the industry awaits a decision from the Government. The Government's present attitude is that this subject is a matter of general policy and not one to be decided by the boards of individual nationalized industries.

E.I.B.A. BALL

So far this year the Electrical Industries Benevolent Association has been behind its "target" figure this year, month by month, and this is a situation which the industry should not allow to continue. An opportunity of redressing the adverse balance arises again on the occasion of the Association's annual ball which is being held at Grosvenor House, London, on 11th November. This is always an excellent show, well worth the small expenditure involved, and moreover it is a valuable social event at which members of the far-flung branches of the industry can get together as on few other occasions. We hope that this year's Ball will attract greater support than ever, with a corresponding effect upon the Association's funds.

Thermo-Electric Corrosion

Protection of Kaplan Water-Turbine Runners

By HANS KRENN*

CONTINENTAL investigators attribute rust formation and other kinds of corrosion of metals to the action of electrolytic currents. The local formation of galvanic cells, which give rise to these currents, is caused by temperature differences between metal parts that are connected by a conducting liquid.

In the electro-chemical series substances are arranged according to their potentials, which means that each is electrolytically negative with respect to the positive material following it in the series. But a potential difference can occur between two electrodes consisting of the same material when one of them is heated or cooled. The heated part will become the anode, in an electrolyte, so current will flow from the warmer to the cooler area. Oxygen and halogen ions migrate toward the hot anode, the hydrogen and metal ions toward the cooler cathode. Parts of one and the same machine body, or adjacent small areas of pipes, etc., can in this way act as electrodes, so that heat flow may then be the cause of corrosion. Slight local temperature differences will be found everywhere at all times, not only in connection with thermal processes. The sun or the wind may be the cause, just as temperatures differ between a liquid and the walls of its container or the surrounding air.

Effect of Liberated Oxygen

In the case described corrosion of the metal was not brought about by electrolytic decomposition but by atomic oxygen, liberated by electrolysis, which migrates towards the anode and imparts corroding properties to the liquid skin of the gas bubbles which collect on the wall. If for some reason or other, such as increased flow velocity, etc., the oxygen bubbles do not cling to the anode but are washed away and collect at other points (in cavities, under guide vanes, in bends, etc.), then pitting will occur at these points of gas concentration. It is not caused by mechanical action, as is still generally assumed; the pitting of steam turbine runner vanes, too, is not caused by the hammering effect of water drops, but by electrolysis taking place in the condensed water that accumulates on the vanes during stoppage.

Corrosion develops very much more rapidly than is apparent from periodical inspection as the reaction only takes place in the sometimes very short time when the heat flow which causes it exists. Corrosive phenomena which have been attributed to reactions taking place during running periods, in reality develop in the often short intervals of warming up and cooling.

Remedial Measures

Methods of combating the harmful effects are (1) removal, or interruption, of the heat flow if it is not occasioned by the normal working conditions; (2) equalizing the potential of the local galvanic couple by applying another of opposite sign; (3) installing an anode with a potential exceeding that which is caused by heat flow, suitably arranged to move the corrosive reaction caused by the predominant anode potential to an area where no harm is done to the installation. Each individual case will need investigating to determine which of the precautionary measures is most easily applicable and would, therefore, be the most economical.

The following is a typical case of successful counteraction against the pitting of Kaplan turbine runners in a hydro-electric plant. In 1923 the Siebenbrunn power station on the River Traun, near Gmunden in Upper Austria, was put into commission. The first two Kaplan turbines were each of 1,000 h.p. at 250 r.p.m, 16cu m/sec of water flow and 6m head. Provision had been made in the layout for a third unit and it was installed

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five years later. They were the first Kaplan turbines built by Messrs. J. M. Voith, of Heidenheim, Germany, and claimed to be the first large turbines of this type to be built anywhere.

Of the water head, one-half is draft head and the runners are placed 3m above tail water level. The maximum efficiency determined in the acceptance tests was 87 per cent. The turbines are directly coupled to screened three-phase generators of 800 kVA at 10 kV.

Cavitation Suspected

After three months' service the phosphor bronze runners showed pitting on the backs of the propeller blades, covering about one-quarter of the surface and running from the edges to the centre and up to 17 mm deep. The makers and influential scientists were convinced that the corrosion was due to cavitation, which seemed to be inevitable on account

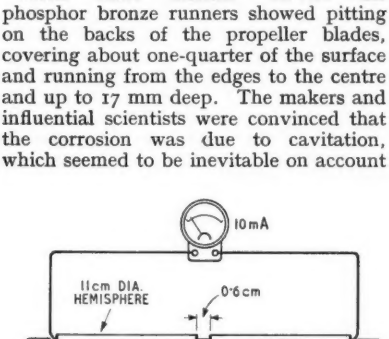

Fig. 1.—Experimental electrolytic bath

of the elevated position of the propellers and, as a consequence, the low pressure exerted on the backs of the blades. This was also to be expected in consideration of the high efficiency attained. Pitting was explained by formation and collapse of cavities on the backs of the blades, i.e., water hammer.

In striking contrast to this supposition was the fact that the corroded areas by no means looked like hammered surfaces. They were rough with serrated edges and in appearance might be compared to lunar mountains. Besides, the surfaces were not hard, as should be expected after hammering. Therefore, research was continued and led to the discovery that erosion of a similar nature was brought about by electrolysis.

The d.c. dynamos used for exciting the generators were in proper condition and had high insulation values. Stray currents (galvanic) were out of the question considering the remote situation of the power station. The magnet wheels and exciting armatures of the generators are mounted directly on the turbine shafts, in contrast to the design employed in the other River Traun power stations, which are fitted with normal Jonval and Francis turbines, the generators being driven by wooden cog-wheels and insulating couplings. Now, considerable energy is converted into heat in the magnet wheels and exciting armatures by copper and iron losses; adding to it part of the heat developed in the bearings, shows that 10 kg-cal/hour is conducted by the main turbine shaft to the Kaplan propellers and thence into the water.

But even the slightest heat flow is capable of generating an appreciable potential and minute currents will lead to noticeable corrosion. The following test was carried out to prove the validity of this statement. Two hemispheres made of steel sheeting were obtained by cutting apart a float valve ball of 11 cm diameter. The current measurements were made with a moving-coil instrument fitted with a permanent magnet and

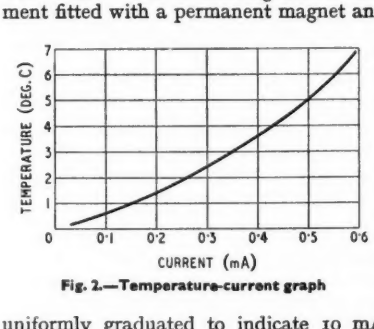

Fig. 2.—Temperature-current graph

uniformly graduated to indicate 10 mA equal to 100 mV; the instrument resistance was 10 ohms. A 10: 1 solution of common salt was used as the electrolyte; the temperature of the solution was 20 deg C, this being the temperature of the surrounding air at the beginning of the tests.

The two half-sphere electrodes were placed 0.6 cm apart in a porcelain trough filled up to a level of 1.5 cm so that the active electrode area was 52 sq cm (Fig. 1) and heating was effected by pouring

warm water into one of the hemispheres, which thereby became the anode. Temperature and current measured are shown in Fig. 2. As there can only have been a slight difference of temperature between the outer and the inner anode surfaces, the elevation of the temperature of the warmed electrode in relation to that of the bath was assumed to be the average between the temperature of the liquid in the trough and that of the electrolyte

The measured current averaged 0.6 mA, which (through 7 deg C rise) represents 0.085 mA/1 deg C and also (for 52 sq cm active area) equals 0.00164 mA/sq cm/1 deg C. With that current density persisting for half an hour, during which the test was carried out twice running by refilling the electrode with fresh warm water, a perceptible red-brown tinge appeared at the bottom of the porcelain trough in the vicinity of the anode, caused by rust deposited from it, while the outer surface of the immersed part of the anode showed the typical irregular rusting appearance. The test is reproducible and repetition led to the same results. It not only indicates the current density, but also the speed with which such corrosive reactions take place, although no analytical determination of the weight losses of the anode per calorie of additionally applied heat was carried out.

Thus in the case of the Siebenbrunn turbines the test results showed that a small current would suffice for equalizing the heat flow potential in spite of the considerable size of the heated electrode area (the Kaplan blades and hood) amounting to 55,000 sq cm. Raising the temperature of these parts, which come into contact with water, by an average of 1-2 deg C could, in the case of steel, according to the test values, be achievable by applying 10-20 mA, taking into consideration the lower conductivity of river water.

When planning the path of the counter current from the turbine casing in the direction of the runner, the fact had to be taken into account that it was not possible to install special insulators. The revolving shaft is, to some extent, electrically insulated by the oil film of the bearings, but satisfactory values of insulation resistance relative to the casing were not found when measurements were made and, therefore, considerable current losses had to be taken into consideration. A useful effect of 10-20 per cent of the protecting current applied could be expected and to provide a safety factor for this first installation, a counter current of 0.5-0.6 A was conducted from the casing to the runner.

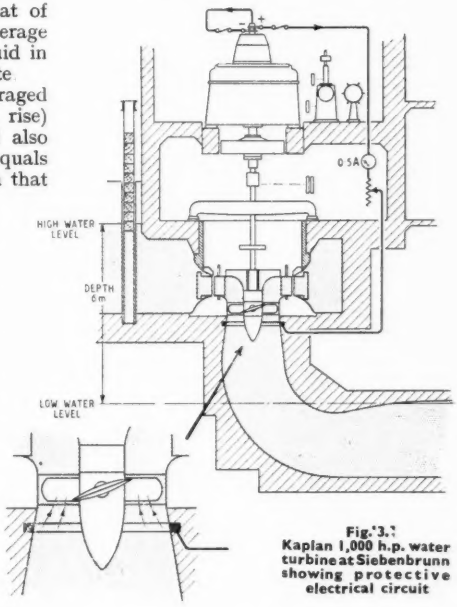

Fig. 3. Kaplan 1,000 h.p. water turbine at Siebenbrunn showing protective electrical circuit

To simplify matters the d.c. exciter of the generator was used as the source of protective current (Fig. 3) with the shaft electrically connected above the exciter to the negative brushes by means of an insulated silver wire (fusing at 1 A) and an insulated conductor (also with a 1 A fuse) connected to the turbine casing near the runners. A slide resistance served as current regulator.

Before making these installations plaster casts of some of the existing corroded areas were taken and marked for identification. When, after six weeks, the blades were again inspected and

plaster casts of the marked areas again taken, comparison with the casts formerly made showed that erosion had not made any appreciable progress on the propeller to which the protective circuit had been applied. The casing and bearings were also undamaged, whereas on the other unprotected machine corrosion had developed in a very marked degree. The propeller of the second turbine was repaired by welding and fitted with the same means of protection. The third turbine, installed in 1928, in contrast to the first two, had cast steel blades, the backs of which after a test run of two days already showed considerable rust moulds which are the sign of the beginning of corrosion. After protection the moulds did not develop further.

Runner Level Lowered

Now, after 25 and 20 years' service respectively, all three turbines are still working satisfactorily with the original runners; no repairs have been necessary, while the protective currents have not led to any other complications.

Nevertheless, the turbine makers, Messrs. Voith, Heidenheim, in their later designs, placed the runners at a lower level in order to prevent vacuum at the backs of the blades and so to avoid cavitation. Corrosion does not take place if the bubbles containing atomic oxygen are not allowed to collect at the anode, but are washed away. The lowering of the runners proportionately increases the fluid pressure on the backs of the blades and this counteracts the tendency towards cavitation.

In a Kaplan turbine at Gratwein in Styria fitted with propellers at almost tail water level, erosion occurred under a guide vane in the cast-iron casing bends just above the runner. This part of the casing most certainly was the cathode, just as at Siebenbrunn where conditions are similar. But the gas bubbles were flung off the anodic runners and there was no pronounced action of the draft head as at Siebenbrunn, so some of the bubbles passed into the hollow space underneath the guide vanes at the bend in the casing, which was invariably wet, and violent attack by oxygen ions had eaten away the metal in a very short time. Thus, under special conditions, even part of the cathode may be destroyed if the atomic oxygen evolved during electrolysis collects in such a part.

Under these circumstances it would have been a mistake electrically to connect the turbine casing with the positive pole because then erosion would again take place if the protective current were predominant. In a case like this one should insert an anodic ring in the concrete bend below the runners (Fig. 3), as was later also fitted to the Siebenbrunn turbines as a safety measure against possible effects of the continuous application of the protective current. As the anodes are removed from the whirling zones of the runner into the more parallel stream in the draft pipe and are, therefore, always well rinsed, these rings in the Siebenbrunn turbines, even after more than 20 years' continuous service, have not yet been consumed. It is true that they are somewhat wasted, as is the concrete below the rings, but they will do service for many years to come.

As cavitation under the runners is in no way influenced by the feeble protective currents, this installation proved that the corrosive phenomena are not caused by cavitation or its mechanical reactions. Incorrect diagnosis has led turbine manufacturers in all countries to lower the runners, which not only increases the cost of the plant by necessitating longer main shafts and additional bearings, but also involves higher building costs in connection with lowering the suction pipes in the river bed and additional work on the foundations.

These additional costs are not a guarantee of avoidance of runner damage by corrosion, which, as shown above, can be prevented by cheaper methods suggested by acceptance of the flow of heat as the cause of corrosion.

Triode Valves

A 47-page publication, "Electrons in Triodes," which has just been issued by the Edison Swan Electric Co., Ltd., is the second of a series of educational booklets being prepared by the company. As its title implies it outlines the history of the triode valve and explains its fundamental working principles in a simple and easily understood manner. Copies of the booklet are available free of charge to education authorities, radio societies, and other bona fide bodies.

Views on the News

By REFLECTOR

GLASGOW has always been rightly proud of its tramway system—the largest and cheapest in the British Isles. But in modern traffic conditions trams have their drawbacks and I am not surprised to read an article in the *Glasgow Herald* in which the Lord Provost (Mr. V. Warren) calls for their replacement over the next fifty years. I am glad to see that he does not propose that the example of London should be followed, i.e., that the substituted vehicles should be oil buses. He goes all out for trolley-buses; he had a great deal to do with their introduction to Glasgow a few years ago. The Lord Provost produces as arguments in favour of the trolley-bus (apart from its inherent attractions) the facts that it does not need imported fuel oil and that Glasgow has its own power station. .

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Whale killing by electrical means has been the subject of study and experiment for some years and now attention is being turned to smaller "denizens of the deep." In the latest experiments electricity does not play a lethal part, it is merely an accessory before the fact. Screens charged with electricity are used to divert the fish into definite channels to enable them to be more easily picked up. The device has also been used in America to keep fish away from hydro-electric plant intakes.

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It is, perhaps, inevitable that there should be some misconception on the part of the lay press of the duties of Electricity Consultative Councils. Recently I read a report of one of these bodies deciding to inaugurate a hire-purchase scheme. Now a statement in a daily paper that last winter's surcharge in West and South-West Scotland is to be refunded completely appears to have its origin in a similar misunderstanding. Actually, the S.W. Scotland Consultative Council, approached by the Board for its views, *recommended* that the Board should refund any surplus obtained from the surcharge within the year. The position has been clarified by Mr. J. S. Pickles, chairman of the Board, who explains that the financial results on completion of the rebate period next January will have to be considered before anything definite can be said.

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After babies' coatees, fabrics. What I mean is that one Electricity Board having had in its monthly magazine knitting instructions for women readers, thereby upsetting the local Press, another has just arranged a lecture on "Modern Fabrics." It has always been recognized that the way to extend the use of electricity in the home is to get at the women and it can be done directly or by roundabout means. The connection between electricity and babies' coatees is not immediately apparent, but the talk on fabrics linked up with a washing machine demonstration and was presented by the makers of a well-known soap powder.

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It is generally believed that superfluous regulations are made only by the Government and Government-sponsored bodies, but if the *Star* is to be believed the railways, before nationalization, did well in this respect. According to the newspaper the rule-books issued by the four railway groups, almost identical, contained nearly 250 rules, many of them divided into sub-sections. "There are many rules which are, normally, never applied and others which are partly waived for the convenience of travellers." The *Star* says that if all the rules were observed, and that is what is now feared, life would be hard for the regular traveller. Let this be a warning to electricity authorities and others who make rules.

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The *Manchester Guardian* publishes the following note under the heading "Power Cut":—

> "The horse trams at Douglas, Isle of Man, will stop for the winter on Saturday, instead of at the end of the month, because of a shortage of hay for feed."

Personal and Social

NEWS OF MEN AND WOMEN OF THE INDUSTRY

AS briefly reported in our last issue, **Mr. H. Tweedale,** A.C.A., is retiring from the position of divisional accountant to the North Western Division of the British Electricity Authority, but will continue to carry out specialist duties in the Accountant's Department. He joined the

Mr. H. Tweedale

Mr. A. McLellan

Central Electricity Board as district accountant for the N.W. England and N. Wales District in 1930, and became divisional accountant to the N.W. Division of the B.E.A. in 1948. **Mr. A. McLellan,** C.A., who succeeds him as divisional accountant, has held the post of senior assistant accountant. He was educated at Clydebank High School and Glasgow University and was articled to a firm of chartered accountants in Glasgow. He joined the Central Electricity Board in 1932, and has been senior assistant divisional accountant since vesting day.

Mr. B. A. Williams, who has been associated with E.M.I. Factories, Ltd., at Treorchy for several years, has been appointed to the post of sales representative for Wales of Alpha Accessories, which is controlled by Electric & Musical Industries, Ltd.

Mr. A. V. Perry has been appointed chairman of the Ever Ready Trust Co., Ltd., in succession to the late Mr. Magnus Goodfellow, and **Mr. G. W. Orchard** has been appointed manager.

Mr. W. J. T. Dimmock, assistant works manager of Hoover, Ltd., at Perivale, left on 22nd September for the United States with a team sponsored by the Anglo-American Council on Productivity, which will study mechanical aids and handling devices for use in the factory. Mr. Dimmock was recently appointed secretary of the Mechanical Handling Committee and is also representing the Institution of Production Engineers.

Mr. C. F. Jackson, A.M.I.E.E., has been appointed sales manager of the Control Gear Department of the Electrical Apparatus Co., Ltd., and **Mr. F. Hill,** A.M.I.E.E., has been appointed Birmingham district manager. **Mr. A. V. Lawry** has resigned his position as control gear sales director in order to take up another appointment.

Mr. D. R. Perkins, formerly with the Shell Petroleum Co., Ltd., has joined the staff of the British Central Electrical Co., Ltd.

M. Stevenin, deputy superintendent of a power station at St. Ouen, Brittany, last week toured the power stations in the Merseyside and North Wales Division as the guest of the authorities, who want an objective opinion of practices at different power stations under nationalization.

Mr. H. J. Finden, M.I.E.E., who is responsible for the development and design of electronic instruments in the Plessey Co., Ltd., is to read a paper on "Precision Measurement of Engine R.P.M." at the Conference on Instruments and Measurements which is being held in Stockholm this week. The Conference has been arranged under the auspices of the Royal Swedish Academy of Engineering Sciences (IVA) and the Association of Technical Physicists (TFF). The paper, illustrated by lantern slides of the Plessey electronic precision engine speed measuring equipment, briefly reviews the electrical bridge, frequency meter and magnetic-drag methods of measuring rotary motion, and demonstrates how limitations in accuracy and frequency range of these methods led to the development of the high speed electronic counter.

Mr. H. J. Finden

Mr. and Mrs. George Marr celebrated their golden wedding on 23rd September. Mr. Marr was the founder of two electrical accessory manufacturing concerns and still takes an active part in the affairs of Marbourn, Ltd., makers of "Marbo" accessories. He started manufacture in 1896, and it is claimed that he first introduced the first flat switch, as distinct from the tumbler switch, and also the first combined switch and plug.

Mr. Vladimir K. Zworykin, vice-president and technical consultant of the Radio Corporation of America Laboratories Division, has been awarded the Lamme Medal for 1948 for "his outstanding contribution to the concept and design of electronic apparatus basic to modern television."

Seven long-service employees of **Pritchett & Gold** retired on pension recently. They included one man with fifty-six years' service and three with over fifty years each. These pensioners do not lose touch with the factory, and they pay frequent visits to it and often take part in the social activities of the workers.

On 16th September, **Falk, Stadelmann & Co., Ltd.,** held the first of the season's staff dances at the Victoria Halls, Holborn, organized by their social committee "Veritasefesca." Over 200 people spent a pleasant evening dancing to the music of the "Melody Makers." Prizes were presented to lucky members of the staff by Mrs. Hugo Falk, and in a short speech Mr. Hugo Falk thanked the social committee for their splendid effort and hoped the staff would give their support to ensure the success of future social events.

Mr. H. G. Leivesley, M.I.Mar.E., A.M.I.E.E., retires on 30th September after twenty-seven years at the Trafford Park Works of the Metropolitan-Vickers Electrical Co., Ltd. The company will, however, have the advantage of his part-time services until the end of the year. Mr. Leivesley received his technical training at the Liverpool School of Technology and Liverpool University. This was followed by an honours course in electrical engineering at the Harris Institute, Preston, under the late Mr. G. E. Gittins, who later became sales manager of Transformer Department at Trafford Park.

Before 1922 Mr. Leivesley had been with the Southport Electricity and Traction Department, and Vickers Armstrongs, Ltd. In that year he joined the newly formed Marine Department at the Trafford Park Works, of which he was later assistant manager. From 1935 until his retirement he was liaison officer between Metropolitan-Vickers and Vickers Armstrongs. Mr. Leivesley's duties will be taken over by **Mr. A. Walton** of the Marine and Special Contracts Department.

Mr. R. R. Whyte, M.B.E., B.Sc.(Eng.), has been appointed superintendent of the Gas Turbine Department of the Metropolitan-Vickers Electrical Co., Ltd. Educated at University College School and City and Guilds Engineering College, London, and Freiburg University, Mr. Whyte joined the company as a college apprentice in February, 1933. After an apprenticeship at the Prague works of the C.K.D. he joined the Turbine Experimental Department; two years later he transferred to the Steam Turbine Manufacturing Department. Since 1944 he has been assistant superintendent in charge of the Gas Turbine Manufacturing Department.

Mr. R. R. Whyte

Over 150 employees and their friends were the guests of the directors of the **Lindley Thompson Transformer & Service Co., Ltd.,** on 17th September. The party travelled in five coaches to Southsea and lunch was taken at the Rock Gardens Pavilion.

On 3rd September, 132 employees of **McKechnie Brothers, Ltd.,** were presented with long-service awards by Mr. J. Roe, chairman of the company, who himself has over fifty years' service. Each employee received either a watch or clock. Among those receiving awards was Mr. W. Hayes, sales director, who has over forty years' service.

Sir Peter Bennett, M.P., chairman and managing director of **Joseph Lucas, Ltd.,** recently made presentations in Birmingham to 447 members of the staff from all parts of the country with an average of 31 years' service. Each of the 399 men and 48 women received a wristlet watch and a certificate bound in a leather folio bearing the recipient's name. A surprise presentation of an inscribed gold wristlet watch was made to Sir Peter on behalf of the long-service staff by Mr. C. Copper, of Birmingham, who has forty-nine years' service.

The directors of Joseph Lucas, Ltd., have made awards totalling £110 to Mr. Albert Shephard, a tool maker, for an idea submitted in a works suggestion scheme. Mr. Shephard's idea first gained an award of £10, and was later adjudged the best safety suggestion of the month and won him a special award of another £100. He received his awards from Mr. R. C. Leech, general

factory manager, at the Lucas works, Shaftmoor Lane, Birmingham.

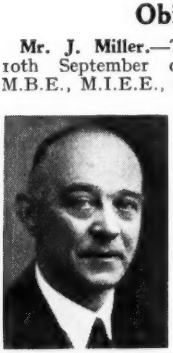
The Horticultural Section of the **Benjamin Social and Athletic Club** (Benjamin Electric, Ltd.), held its first flower and vegetable show on 10th September at the clubroom at Tottenham. A large and selective list of entries testified to the skill and enthusiasm of members, the section for preserves being particularly well supported. The exhibits were judged by Mr. Walkden, assistant editor of *Amateur Gardening*. A large number of club members and their friends visited the show, which was followed by a dance at which prizewinning exhibits were raffled and auctioned.

A party of eighty-eight employees of the Dalston Stores of **Siemens Electric Lamps & Supplies, Ltd.,** with their wives went to Margate by coach on 3rd September. They were joined at Margate by a number of head office personnel, including Mr. C. Hughes, sales manager, and Mr. B. N. Dunster, London branch manager. Lunch was served at the Sun Pier Restaurant.

Mr. A. Knight, who claims to have introduced car radio to Britain in 1932, has joined Philips Electrical, Ltd., as their car radio manager.

Obituary

Mr. J. Miller.—The death occurred on 10th September of Mr. James Miller, M.B.E., M.I.E.E., manager of the Glasgow district office of the British Thomson-Houston Co., Ltd., for nearly twenty-seven years. Mr. Miller, who was born in 1887, received his technical education at the Royal Technical College, Glasgow, of which he became an associate, and his engineering training with Robert Addie & Sons, Ltd., Coatbridge. In 1908, he joined the B.T.H. Co., Rugby, as a student apprentice, becoming engineer in the Power & Mining Department in 1911 and engineer, Glasgow district office in 1912. He served during the 1914-18 war in the Royal Engineers (52nd Division). He was wounded at Gallipoli and later was seconded to the Ministry of Munitions. From 1919 until 1922 he was partner in Thomas Young, Son & Miller, consulting engineers, Glasgow, and then rejoined the B.T.H. Co., being appointed manager of the Glasgow office.



The late Mr. J. Miller

Mr. H. A. Nevill.—The death occurred on 15th September, at the age of seventy-one, of Mr. Harry Anderton Nevill, M.I.E.E., who from 1920 to 1945 was engineer and manager of Peterborough electricity undertaking. On his retirement he had served various local authorities for a total of forty-three years. He went to Peterborough from Birmingham, and succeeded Mr. T. Rowland, who was acting engineer from 1915 to 1920.

Mr. F. V. L. Mathias.—The death is announced of Mr. F. V. L. Mathias, a former borough electrical engineer of Warrington, which occurred at his home "Pine Trees," Pinner Hill, Middx., on 10th September, at the age of seventy-six. Mr. Mathias, who retired in May, 1939, was also on the North Western District Council and Board for the Electricity Supply Industry.

Wills

Mr. A. C. Whitmee, M.B.E., of the Atlas Electric & General Trust, Ltd., who died on 16th June, left £94,948 gross (£92,057 net).

Lord Melchett, formerly deputy chairman of Imperial Chemical Industries, Ltd., and a director of a number of companies including the Palestine Electric Corporation, Ltd., who died at Miami, Florida, on 22nd January last, left £96,968 gross £34,688 net).

Next Week's Events

Monday, 26th September

BIRMINGHAM.—James Watt Memorial Institute, 6 p.m. I.E.E. South Midland Radio Group. Chairman's address by Dr. K. R. Sturley.

Tuesday, 27th September

WEST BROMWICH.—Grammar School, 7.30 p.m. Institute of Industrial Supervisors (West Bromwich Section). Inaugural meeting.

Wednesday, 28th September

LONDON.—Polytechnic, Regent Street, W.1, 7.30 p.m. Institute of Industrial Supervisors (London Central Section). Inaugural meeting.

Thursday, 29th September

BIRMINGHAM.—Midland Electricity Board's Service Centre, Paradise Street, 7 p.m. Electrical Power Engineers' Association (Midland Technical Group). "Power Stations, Past and Present," by F. W. Lawton.

DUDLEY.—Dudley and Staffordshire Technical College, 7.30 p.m. Institute of Industrial Supervisors (Dudley and District Section). Inaugural meeting.

Friday, 30th September

LONDON.—Caxton Hall, S.W.1, 6.30 p.m. Electrical Power Engineers' Association (Southern Meter Engineers' Group). "Lighting Through the Ages," by W. T. O'Dea.

Correspondence

Electricity Boards' Methods

IT is of interest to note from "Views on the News," in your 9th September issue, that two of the Electricity Boards, after 28 days in one case, and 14 days in another, following despatch of their accounts, confront laggard consumers with a notice threatening them with disconnection at the end of seven days unless they pay.

We, as suppliers to Electricity Boards, are faced with a position which to say the least is of interest, although we dare not issue threats as they do. We have accounts for goods supplied to Boards on April 26th last for amounts considerably in excess of the average consumer's monthly account, but while statements have been sent monthly payment has not yet been received.

The one-way-track mind of the Area Boards is illustrated by their methods of dealing with money due to them and due from them and it is a pity that they are not more reasonable in their attitude and desire to pay outstanding bills. It would be of interest to know whether other suppliers are experiencing similar difficulties in obtaining payment.

PATIENT

E.I.B.A. Needs

IT seems to be taking some time effectively to drive home the fact that the people and interests in the electrical industry are calling for services from the Electrical Industries' Benevolent Association far in excess of the amount of funds which they are providing.

Last year the Association had to sell investments to keep going, for the calls on its funds went up by £9,000, and there was a £4,000 deficit on revenue account for the year, even before taking into account capital expenditure involved in equipping its home for old people at Broome Park, Betchworth, Surrey. This cost the Association a further £6,000 in the twelvemonth, all of which could have been contributed by the industry during the year. In other words, the Association was called upon to do a certain considerably increased job—and then received £10,000 less than was needed to do it!

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

Last year the situation would have been much worse but for an increase in charitable income of £4,000 which E.I.B.A. realised, and this achievement is very considerably to the credit of certain companies who, on having the facts put before them, doubled their subscriptions. May I commend this idea to those who did not do so?

I also commend the same idea to the Association's many personal subscribers. I am sure that there are many associate members paying their 5s a year who could well afford 10s, and many people in responsible positions who are satisfied by paying a membership subscription of £1 a year when they might easily make it double or more.

This is a matter for the individual concerned; it is not something we can leave to "the other fellow" and I hope that this appeal to the individual enterprise of the members of the electrical industry, the members of which are more than ordinarily well grounded in physics and mechanics, and who, therefore, will have some appreciation of the law that "action" and "reaction" are equal and opposite, will produce an immediate and appropriate reaction.

E. C. HOLROYDE,
President, E.I.B.A.

32, *Burlington Street,*
London, W.1.

Overseas Electrical Trade

ALTHOUGH exports as a whole showed a decline in August, shipments of electrical goods and machinery at £9,947,564 showed substantial improvements both over the July figure (£9,180,214) and also the August, 1948, figure (£7,990,701). The total is, however, still well below that for June (£11,034,248), which was the second best on record. Exports of electrical goods and apparatus were valued at £6,547,973, which is £1,020,333 more than in July and £677,351 more than in the corresponding month last year. Generating plant exports (£949,549) were over double those for August, 1948 (£419,386).

Railway Electrification

Central Line Extension

ON Sunday next London Transport's Central Line will be extended over the newly-electrified Eastern Region tracks from Loughton to Epping, adding to the system five miles and three more stations, Chigwell Lane, Theydon Bois and Epping. This will be the eighth extension of the Central Line since the war, and the last to be carried out under existing authority for works outstanding from the 1935-40 New Works Programme. With the projection of the electric services over this section the Eastern Region steam service will be discontinued and steam trains from Ongar will in future terminate at Epping, where passengers will transfer to Central Line trains.

The Eastern Region tracks have been re-equipped throughout with London Transport's standard automatic colour-light signalling and points converted to power operation. Conductor rails, mostly laid before the war, are welded into half-mile lengths and tracks have been relaid and re-ballasted. Point heaters and current rail de-icing baths are installed as standard equipment. In the installation of conductor rail jumper cables a new departure has been made by vulcanizing the ends of the cables to the rail terminals. Another innovation —to eliminate the use of concrete troughing to ground gear—is the employment of multi-core rubber covered cables, with each core separately screened, for carrying current to train stops and point mechanisms. The cable has a special ribbing on the outer cover to prevent damage. Power supply for the extension will come from a new substation at Epping, fed at 22 kV from London Transport's Greenwich generating station.

Platforms at Loughton, Chigwell Lane, Theydon Bois and Epping have been reconstructed and improvements to the last three stations include the installation of electric lighting. Chigwell Lane Station is being renamed Debden.

In general, the civil engineering side of the works has been carried out by Eastern Region, British Railways, and the equipment for electrical operation by London Transport.

Shenfield Scheme

The Railway Executive announces that the Minister of Transport, Mr. Alfred Barnes, has accepted an invitation to perform the inaugural ceremony when the first electric passenger train leaves Liverpool Street for Shenfield (Essex) on 26th September. From this date a progressive replacement of steam by electric traction will be effected on this section of the Eastern Region suburban lines, working up to a full electric service between Liverpool Street and Shenfield by 7th November next.

Northern Ireland Strike

ABOUT 3,000 manual workers at the Belfast, Ballylumford and Londonderry power stations last week staged an unofficial strike to enforce their claim for the increase of 1½d per hour already granted to manual workers in the electricity supply industry in Great Britain.

On Friday morning last naval men, including ships' stokers, were drafted into Belfast and Larne to take over and operate the three stations as soon as the night shift stopped work. The technical staffs remained on duty and the supply was generally maintained.

Attempts to avert a stoppage were made on Thursday last week by the Ministers of Commerce (Mr. W. B. Maginess) and Labour (Mr. W. V. M'Cleery) who met employers' and trade union representatives on the National Joint Industrial Council for the industry. In the course of an agreed statement published later it was said that the attitude of the unions was that the strike was unofficial.

Before a Board of Arbitration which had been set up to hear the claim earlier in the week, the employers argued that the 1½d rise given to cross-Channel workers was to iron out an irregular system of "plus rates' and that there was no reason why the same should be done in Northern Ireland. The tribunal ruled by a majority that the claim had not been established. It recommended that the question of shift rates should be considered at an early date by the Northern Ireland Electricity Supply Industry Joint Industrial Council and that the whole question of an agreement regulating wages in the industry in Northern Ireland should be considered by the J.I.C.

The Electrical Power Engineers' Association instructed all members of the technical staffs in the undertakings affected that their normal duties and responsibilities included an obligation to maintain supplies to the best of their ability.

The desire was expressed for an early settlement of the dispute and it was stated that if a settlement was not reached in the very near future the Association would be "compelled to give very serious consideration to the question as to how far it would be justified in continuing to impose such an excessive strain on members."

On Monday last the strikers were joined by men in other departments of the Electricity Supply Board and about 1,000 shipyard workers, mainly electricians, decided to come out in support of the strikers.

I.E.E. Centre Chairmen

FURTHER BIOGRAPHIES

WE have already published biographies of the chairmen of the Sections and five of the Centres of the Institution of Electrical Engineers for the 1949-50 session, and we now give below brief notes relating to the chairmen of the remaining Centres.

Mr. D. C. Fleming, B.Sc. (Mersey and North Wales Centre), is staff officer with British Insulated Callender's Cables, Ltd. He received his education at the Merchant Taylor's School, Crosby, and at the University of Liverpool, and served a college apprenticeship with the Metropolitan-Vickers Electrical Co., Ltd., with whom he was engineer in the Traction Erection Department from 1924 to 1928. In the last-mentioned year he joined British Insulated Cables, Ltd. (now British Insulated Callender's Cables, Ltd.), as Contract Department engineer, and in 1941 became manager of telephone cables production, a position which he held until 1943 when he became personal assistant to the executive director. He was appointed staff officer to the company in 1946. In addition Mr. Fleming is staff officer to the B.I.C. Construction Co., Ltd., and other subsidiary companies, and acts in an advisory capacity to other companies in the group.

Mr. A. Latham

Mr. D. C. Fleming

Mr. L. Burdes

Col. H. B. Somerville

Mr. L. Burdes, B.Sc.(Eng.) (Western Centre), is section head in the Commercial Department of the South Western Electricity Board, Bristol. He was educated at Northampton School and at Sunderland Technical College, and served a marine steam apprenticeship in Sunderland, receiving his electrical training with the Metropolitan-Vickers Electrical Co., Ltd. After a period with Smith, Major & Stevens, Ltd., as junior draughtsman, he joined the Metropolitan-Vickers Co. on works and outside erection. He went to Bristol in 1928 as assistant power sales engineer in the Corporation Electricity Department, where he subsequently became power sales engineer, a position which he held until taking up his present appointment with the South Western Electricity Board. Mr. Burdes was formerly hon. secretary of the I.E.E. Western Centre and was chairman for 1948-49 of the Bath-Bristol Section of the Illuminating Engineering Society.

Col. H. B. Somerville, O.B.E., B.Eng. (Northern Ireland Centre), is regional director, Northern Ireland, of the G.P.O. He received his education and training at King William's College, Isle of Man, and at Liverpool University. Entering the G.P.O. as assistant engineer in 1924, he subsequently held the positions of sectional engineer, London (1932), and assistant superintending engineer, Bristol (1937), before being appointed regional director, Northern Ireland, in 1946. Col. Somerville served with the 5th King's Regiment from 1915 to 1919, and in the Royal Signals from 1939 to 1945.

Mr. A. Latham (East Midlands Centre), was educated at Christ Church School, Southport, and at the College of Technology, Liverpool. In 1920 he joined the Southport Corporation Electricity Department as mains assistant, and in 1926 took up the appointment of district engineer with the Electricity Distribution of North Wales, Ltd. His next post was with the Wolverhampton Corporation Electricity Department, which he joined in 1930 as distribution engineer. He was appointed chief assistant engineer in the Blackburn Corporation Electricity Department in 1934, and became chief engineer and manager of the Mansfield Corporation Electricity Department in 1937, being appointed district

manager of the East Midlands Electricity Board in 1948.

Prof. M. G. Say, Ph.D., M.Sc., A.C.G.I., D.I.C. (Scottish Centre), is Professor of Electrical Engineering at the Heriot-Watt College Edinburgh. His education was received at Colfe's School, Blackheath, London, and at the City and Guilds College, South Kensington. He obtained a research bursary with the Department of Scientific and Industrial Research (1922-24), and from 1924 to 1928 he was research assistant to Professor S. Parker Smith, during which period he was for a time in the design office of the British Thomson-Houston Co., Ltd., at Rugby In 1928 he became a lecturer at the Royal Technical College, Glasgow, and in 1933 took up his present position at the Heriot-Watt College.

Swedish Telephone Cable

THE putting into public service of the high-frequency coaxial telephone cable between Stockholm and Norrkoping marks the completion of a valuable post-war export order. It is of interest that the first modern coaxial cable to be laid on the Continent, constructed in accordance with the specification of the International Telephone Consultative Committee (C.C.I.F.), should joint the centres which were linked by the first long-distance repeatered telephone cable laid in Europe twenty-five years ago. The two cables have been manufactured and installed by the same organization.

The new cable, which is entirely of British design and manufacture, contains two pairs of coaxial "tubes," each pair being capable of carrying up to 960 telephone circuits. The cable runs from Stockholm, through Norrkoping, to Goteborg, a distance of nearly 300 miles. To economize in cable cost, it is laid in a straight line across country, instead of following the line of a road or railway like the earlier cable. Several submarine sections which cross inlets of the Baltic are involved.

The section of the cable between Stockholm and Norrkoping, which has just been put into service, can provide 180 new trunk circuits with the terminal equipment now installed. The terminal and repeater equipment is of British manufacture and has been installed and tested by the Swedish Telegraph Administration with the help of experts from England. Amplifying repeater stations are spaced at approximately six-mile intervals. There is one main (attended) repeater station at Vasterljing, approximately midway between Stockholm and Norrkoping, and 15 auxiliary repeater stations (unattended) which derive their power supply from the nearest main station, terminal or repeater, along the coaxial tubes themselves.

A considerable proportion of the equipment is constructed on a new system, developed by Standard Telephones and Cables, Limited, which reduces the space occupied by the terminal equipment and considerably helps maintenance work.

Australian News

From a Correspondent

A SCHEME to convey hydro-electric power generated on the west coast of Tasmania to Victoria and South Australia is now being considered by the Federal Government. This project, which would call for the expenditure of some £400 million, was formulated by Senator C. A. Lamp, who said in Queenstown, that he believed that 1,000,000 electrical h.p. could be made available if Tasmania's electrical potentialities were properly developed. The scheme would require the harnessing of five Tasmanian rivers.

It is understood that the proposal has been discussed with Lord Forrester, chairman of the Enfield Cable Co., who states that there would be no difficulty in procuring a suitable type of cable. (Power would be conveyed first to King Island, then to Appolo Bay, Victoria, then on to western Victoria and South Australia.)

The Western Australian Government Statistician (Mr. R. J. Little) reports that during the six months ended 31st December, 1948, imports included: Covered cable and electrical wire valued at £176,442 (£108,175 from overseas); filament lamps, £44,762 (£7,416 from overseas); telephone and telegraph instruments and appliances, £94,090 (£71,178); electrical heating and cooking appliances, £51,501 (£11,327); other electrical equipment and appliances, £290,540 (£56,819); and dynamo electrical machinery, £220,662 (£172,704).

Telephone "Density"

AT 31st March there were 24.3 telephones per hundred of the population in London City and Administrative County. For Greater London (which includes the City and Administrative County) the figure was 17.6. The figures per hundred of the population in other principal cities and towns were as follows:—Edinburgh, 14.5; Leicester, 10.7; Bristol, 10.5; Leeds, 10.0; Bradford, 9.9; Manchester, 9.8; Nottingham, 9.7; Birmingham, 9.0; Cardiff, 8.9; Glasgow, 8.7; Newcastle-on-Tyne (including Jarrow), 8.2; Sheffield, 8.2; Liverpool, 8.0; Coventry, 7.9; Belfast, 7.5; Portsmouth, 6.9; and Stoke-on-Trent, 5.2.

Biscuit and Cake Manufacture

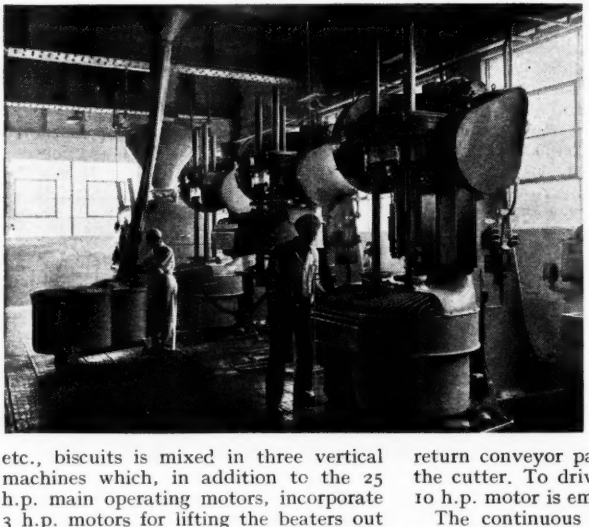
Exclusive Adoption of Electrical Methods in a New Cardiff Factory

WHEN a factory is described as all-electric it is usually discovered that some of the minor operations of production or perhaps the heating or catering make use of other forms of fuel and power. At the new biscuit and cake factory of Elkes Biscuits, Ltd., in Clydesmuir Road, Cardiff, however, this is not the case. There is no gas pipe in the building and for no purpose whatever is solid fuel or oil used. Not only are all factory processes carried out electrically, but the building is warmed and ventilated, hot water is supplied, and food is prepared and cooked by electrical methods. Besides completely eliminating potential sources of contamination of highly susceptible foodstuffs, the exclusive use of electricity ensures an invariable uniform high quality of product and minimizes wastage.

With a floor area of 55,000 sq ft, the factory is 450ft long and 100ft wide with a first floor 100ft by 50ft at each end. At one end the raw materials are unloaded at the receiving bay, the fats, etc., being stored on the ground floor adjoining the mixing department, the dry ingredients going via a ½-ton lift (Herbert Morris) or a push-bar sack elevator (Bagshawe) to the store rooms above. Here the sugar is treated in a pulverizer driven at 6,000 r.p.m. by a 12 h.p., 1,440 r.p.m. motor, the sugar being fed by three screws and forced by revolving beaters through a very fine mesh sieve, while flour is passed through sifting machines on its way to the hoppers serving the mixing machines below. Electrically operated sack cleaners are provided To supply hot water for the processing of the cakes and biscuits an 18 kW water heater with immersion elements is used, a similar 9 kW unit serving the wash-basins, etc., in the office block.

Biscuits leaving the oven and being transferred to the cooling conveyor

The prepared flour and sugar are gravity fed into the pans of the mixing machines to which are also added the fats and other ingredients. Two types of mixers are used. A high-speed horizontal machine with a two-speed 50/25 h.p. pole-change motor prepares hard dough for such biscuits as "Petit Beurre," "Marie," etc. Soft dough for shortcake, etc., biscuits is mixed in three vertical machines which, in addition to the 25 h.p. main operating motors, incorporate 3 h.p. motors for lifting the beaters out of the pans for loading and unloading. Safety devices prevent operation of the mixers while the beaters are raised.

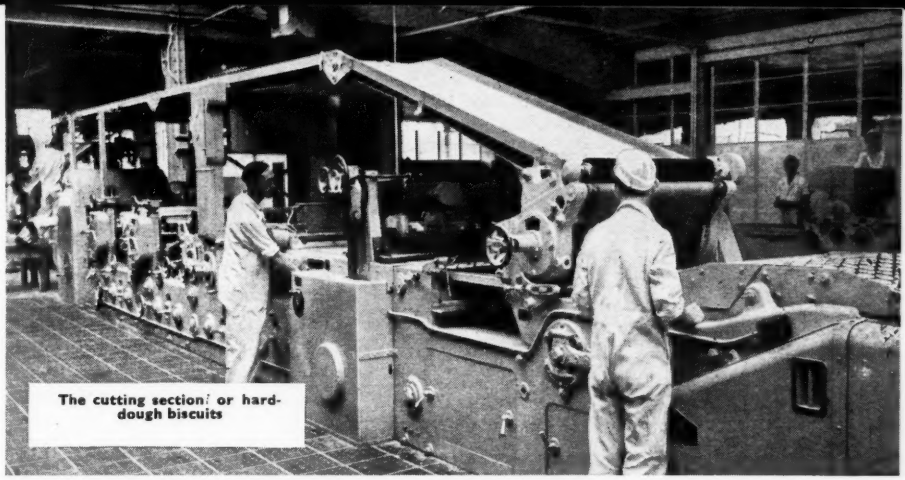


Soft dough is prepared in the nearer machines, hard dough in the high-speed horizontal machine in the background

Leaving the mixers, the dough is passed through two dough brakes which roll it out flat into sheets ready for cutting. The cutting, baking, cooling and packing processes are carried out as a continuous operation with the aid of a series of machines arranged as one unit with synchronized band conveyors, the whole equipment being 350ft long. On the 32in conveyor used for the hard dough biscuits, rollers first reduce the dough to the required thickness, brushes dust-on flour and, if required, sugar is sprinkled on. A cutting head, arranged to move at the same speed as the conveyor, cuts out the biscuits, the round ones incidentally being initially slightly oval to allow for shrinkage in the dough. The cut biscuits pass straight on to the adjoining oven section, while the waste is carried back for re-use on a return conveyor passing over the top of the cutter. To drive the cutting plant a 10 h.p. motor is employed.

The continuous oven, which is 180ft long, is built up in three sections on a solid frame in the form of a tunnel. The elements of the "coiled-coil" type on ceramic formers in steel tubes about 2½in in diameter are arranged above and below the steel band conveyor. Including elements available for preheating the con-

The 180 ft long continuous biscuit ovens have a loading of 525 kW each



The cutting section for hard-dough biscuits

veyor band when starting up, the total loading is 525 kW.

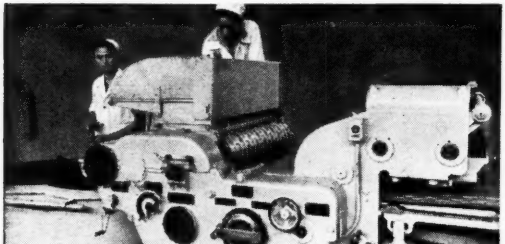
The elements, which are each loaded at 2 kW, are grouped according to the heating zone. At the first of the thirty zones there are nine above and six below the conveyor band; at the exit end the final zones have only two elements in each. Each of the elements is operated by a controller, enabling the heat in any zone to be graduated in nine equal steps from zero to maximum. The arrangement of the heaters is such that an even distribution of heat is obtained for all settings of the controller. The controllers are situated on top of the oven and each of them contains a fuse link in each phase to protect the elements.

The maximum temperature of the oven is varied up to 600 deg F according to the type of biscuit. The time taken for a biscuit to pass right through the oven can be regulated to any period between 3 and 15 minutes. The steel band conveyor is driven through a Stone's gear box by a 3 h.p. Hopkinson motor, which also operates the cooling conveyor. Four revolving brushes, three of wire and one of fibre, for cleaning the oven conveyor, are operated by a $1\frac{1}{2}$ h.p. motor.

To save space the cooling conveyor, which is 230 ft long, is arranged in three sections one above the other. The biscuits first travel up along the top conveyor at the end of which they are tipped upside down on to the second conveyor going in the opposite direction. At the bottom the biscuits are automatically turned over again on to the final section which carries them to the stacking table. Here a number of steel strips, which can be adjustable to any angle on a permanent magnetic plate, guide the biscuits into "alleys" whence a small conveyor carries them up to an automatic stacker feeding the packing table. A single 1 h.p. motor drives all the equipment on the stacking table. After the biscuits have been packed the tins are weighed and taken by belt and roller conveyor to the despatch section.

A "dough brake" makes the dough from the mixers ready for cutting

A similar production line is used for the soft dough biscuits, the only difference being in the cutting section. Here the biscuits are pressed into shape between two rollers or if required passed through a rout press die and cut into lengths with a knife. Provision is made for the installation of two further production lines in the near future.



Rotary moulder for soft dough

On the first floor, in the section corresponding to the dry storerooms at the other end of the building, is an elaborate tin cleaning plant. Tins brought up by a Bagshawe elevator go direct to a continuous hydro washing machine (Robert Kellie & Son). This apparatus which is capable of dealing with 1,000 tins an hour, incorporates two tanks, one holding 500 gal. for washing and the other of 200 gal. capacity for rinsing. Steam from a 350 kW electrode boiler is ejected into the tanks at 6 a.m. and by 8 a.m. when work starts the temperature has reached 180 deg F. Make-up water provided by a 3,500 gal. storage heater loaded at 150 kW is admitted into the tanks. The water is circulated in the plant by means of two pumps driven by one 15 h.p. Crompton motor. From the washer the tins go on a travelling belt through a continuous dryer. This is equipped with four air heater 39 kW batteries, each in two banks of 12 kW and 27 kW, making a total loading of 156 kW. Thermostats are fitted on the 12 kW elements, additional safety thermostats coming into operation at 290 deg F. Fans are employed to circulate the air through the dryer. Watford control gear is used for the tin washer and dryer, a J. G. Statter & Co. circuit breaker controlling the electrode boiler. After drying, the tins are weighed and then sent by roller conveyor for labelling and repacking.

After stacking, the biscuits are packed by hand into tins

In the chocolate coating department the slabs of chocolate (usually weighing $\frac{1}{4}$ or $\frac{1}{2}$ cwt) are flaked in a planing machine. A water-jacketed kettle fitted with four 2 kW Heatrae elements heats the chocolate after which it is poured into a similar water-jacketed tank for the highly critical tempering operation to bring it to just the right condition for use in the enrobing machine.

Biscuits to be coated are placed by hand on the feeding table which carries them on to the conveyor serving the enrober. Chocolate may be applied to both top and bottom or top only if desired; in the latter case the biscuits are turned over

on leaving the machine before passing through the cooling tunnel. A blower removes the surplus chocolate from the biscuits which are then carried by conveyor into a cooling tunnel. The "Hallmark" equipment (J. & E. Hall, Ltd.) used for this employs methyl chloride as the refrigerant.

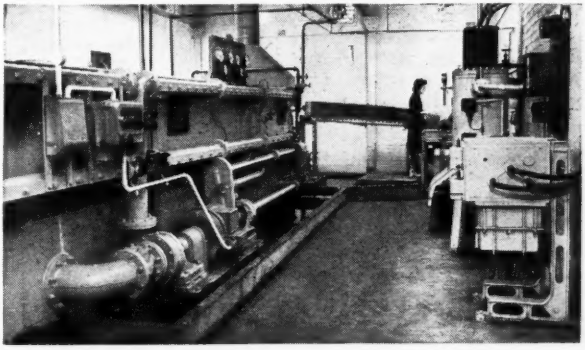
A Baker Perkins "Salerno" cream sandwiching plant is also situated in the same room. The biscuits are fed into two sets of guides in opposite directions so that the cream deposit is made on the lower half of the sandwich, which then passes under the second set of guides, allowing the upper biscuit to fall in place before passing through a cooling tunnel to set the cream. A two-unit heater fed from steam generated in a 70 kW electrode boiler maintains the room temperature at about 80 deg F.

In the cake-making department preparation equipment includes flour sifters, fruit cleaning machines, two-speed mixers for cake mixing, a similar machine for cream and four-speed Peerless whisks also for cream. The batter is taken in troughs to the Collis electro-hydraulic elevator which raises it to the level of the hopper of a Peerless cake depositor, which automatically feeds out the right amount of mixture into the cake tins. Four double draw-plate ovens (68 kW each) are used for baking the cakes, thermostats controlling the temperature to ±5 deg F through Igranic contactors. Serving the canteen kitchen are a potato peeler, a double oven, a steam cooker, a fish fryer, a hotplate, a tea masher and a refrigerator, all of G.E.C. construction.

On the first floor in the dry storeroom and tin washing section at opposite ends of the building is the air conditioning plant arranged in duplicate, each equipment serving half the factory. In each plant the air is cleaned by a washing plant comprising a spray pump (with a 7½ h.p. "Lancomotor" drive) and then, if necessary, warmed by means of hot-water pipes. It is circulated round the factory through air ducts provided with adjustable louvres at appropriate points. The circulating fans used are at present driven by 25 h.p., 1,445 r.p.m. induction motors but to improve control Brook variable speed motors are to be substituted. Five extract fans (3 h.p. motors) are provided over the packing tables.

To provide the hot water for the air conditioning system and also for the radiators employed in the offices two 500 kW Bastian & Allen "Type 90" electrode boilers have been installed. The equipment operates on a closed circuit. The boilers are used in conjunction with two 16,000 gal storage cylinders and a 4,500 gal expansion tank (both made by Foster, Yates & Thom Ltd.), the expansion circuit being arranged at low level. Each storage cylinder is equipped with four thermometers at various levels. The Pulsometer primary pumps used for taking the water from the boilers to the cylinders have a capacity of 410 gal per minute, the secondary pumps for carrying the water from the cylinders to the air conditioning plant and radiators being rated at 330 gal per minute. Each of the pumps is driven by a 3 h.p. motor. Arrangements are, of course, made for running the boilers either individually or simultaneously. To obtain the desired pressure at the end of the factory a small air compressor is employed.

Two Watford "Pigral" panels are used to control the temperature in the



Tin washing plant with electrode steam raiser on right

factory and the offices. Each one is connected to an outside thermostat and also a thermostat in the mixing valve. The equipment is set to give a maximum temperature of 65 deg F. If the water in the system is not warm enough, it allows more hot water to flow through the motorized mixing valves and also shows a red light. The water in the cylinders is heated to 230 deg F but the system is designed to work at temperatures up to 380 deg F. Only in very cold weather is it necessary to have the boilers working every day. In any case they are controlled by time switch to operate only in off-peak hours, between 6 p.m. and 6 a.m.

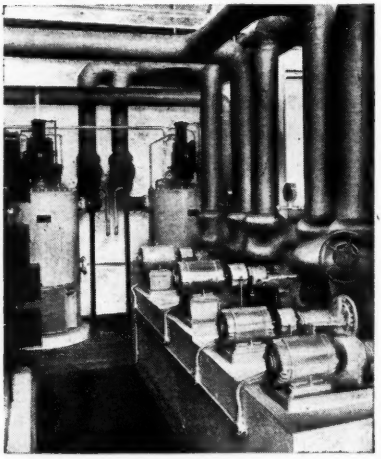
Chocolate enrobing plant

Heating of the factory's garage, which is separate from the main building, is carried out by fifteen 2 kW "Hurseal" oil radiators, controlled by three thermostats. Three electrically operated doors are provided for this garage, other electrical equipment in which includes a charger, sparking plug cleaner and air compressor. In the main workshops there are drilling and grinding machines, a circular saw and industrial type vacuum cleaning plant.

A self-stamping time recorder (International Time Recorder Co.) is used for time keeping. E.M.I. apparatus serves both for staff location and for providing music in the factory. A G.E.C. twenty-five line "Reliance" automatic telephone system is installed.

In the substation a Cooke & Ferguson switchboard with spring-wound circuit breakers control the 6.6 kV supply. Three 1,000 kVA Parsons transformers, stepping down the supply to 400/230 V, are of sufficient capacity for two more ovens. Provision for these is also already made on the low-voltage board which comprises fourteen Electric Construction Co. cubicles—three covering the transformers, two acting as busbar couplers, four for the biscuit ovens (three 525 kVA and one 625 kVA) and the remainder for lighting (100 kVA), tin washers and dryers (400 kVA), mixing and preparation machinery (150 kVA), thermal storage and steam heating plant (1,000 kVA), cake oven and chocolate plant (330 kVA). All the circuit breakers are fitted with plugs to take a recording instrument (Everett Edgcumbe) if required. The substation is equipped with a Pyrene CO_2 automatic fire extinguisher system.

From the substation the main cables are taken in a tunnel 150ft long to the factory where they enter porcelain ducts. B.I. Callender's cables are used through-



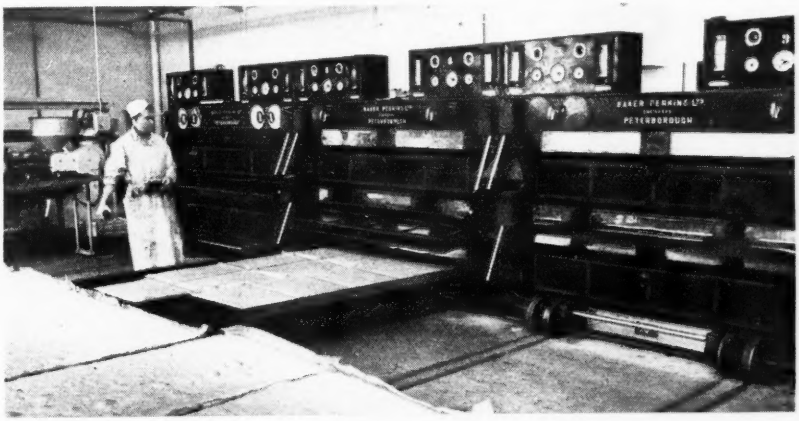
Two electrode boilers (500 kW each) supply hot water for heating the factory. The circulating pumps are seen on the right and the Watford "Pigral" control apparatus on the left

out in sizes from 0.6 in 4-core to 0.25 in 4-core. Two of the largest cables are used in parallel for the thermal storage plant and a sigle 0.6 in cable is employed for the tin washing plant.

At present the factory has a normal consumption of between 50,000 and 60,000 kWh a week of which about 12,500 kWh each is used by the ovens, 2,000 kWh by the thermal storage plant (30,000 in cold weather), 6,000 kWh by the cake and chocolate plant, 15,000 kWh by the tin washing plant and 5,000 kWh in mixing and preparation. This represents an annual consumption of about 2½ million kWh.

The architects for the building were Edward Forshaw & Greaves, of Stoke-on-Trent. F. W. Langley, Ltd., also of Stoke-on-Trent, acting consultants, were responsible for the electrical installation which was carried out by their own installation department with the aid of the Engineering Department of Elkes Biscuits, Ltd. (electrical engineer, Mr. N. F. Handy). All the manufacturing equipment, unless otherwise stated, was supplied by Baker Perkins, Ltd., Peterborough. The thermal storage plant, electrode hot-water boilers, steam boilers, air heaters and electric storage water heaters were provided by Bastian & Allen, Ltd., and the installation of the hot-water boilers, thermal storage valves, mixing valves and pumps was carried out by their sub-contractors, Sulzer Bros. (London), Ltd. Norman Turner, Ltd., supplied and installed the ventilating plant. Various makes of circuit breakers and motor starters are employed, but all the metalclad switch fuses and isolators were supplied by Bill Switchgear, Ltd. Except for a few fluorescent lighting fittings over the packing tables, chocolate department, laboratory, maintenance department, garage and workshop, Benjamin reflectors housing tungsten lamps are fitted throughout the factory.

Special stress should be laid on the way in which day and night loads have been balanced. Although a 1,000 kW thermal storage scheme put forward by Bastian & Allen in the earlier stages did offset the daytime baking-oven load there was the tin-washing plant to be considered. As a result of discussion with the makers this load was transferred to night-time by the installation of the 150 kW 3,500 gallon storage water heater (the steam boiler being used to maintain temperature during the daytime). The steam unit heaters in the tin dryer were replaced by four thermostatically controlled air heater batteries and this arrangement balanced the load and secured a high load factor.



Double draw-plate ovens (68 kW each) are used for cake baking

We are grateful to Elkes Biscuits, Ltd., for permission to visit the factory and to Mr. A. R. Land, the general manager, for the facilities given to us.

Canadian Standards

PROPOSAL TO SET UP BRITISH APPROVAL ARRANGEMENTS

BRITISH electrical manufacturers generally regard the Testing and Approvals Regulations of the Canadian Standards Association as a serious difficulty in the way of increasing British electrical exports to Canada. This is borne out by the number of complaints received from members of the Electrical Industry Export Group.

Mr. D. Maxwell Buist, Export Director of the B.E.A.M.A., in a recent report, stated that in the course of his recent tour as a member of the Engineering Mission to Canada, he had had discussions with the C.S.A. representatives in Toronto responsible for the Testing and Approvals Regulations, and had made a proposal, with which they agreed in principle, that some organization should be set up in the United Kingdom to carry out testing and give approval to appropriate British electrical products before they left the country, thus saving the delay and expense of sending samples and prototypes to Toronto for approval.

The Machine Tool Trades Association is also interested in this matter because of the extensive alterations required on electrically equipped machine tools, after they have reached Canada, by the Hydro-Electric Power Commission of Ontario, which inspects in Ontario, on behalf of the Approvals Division of the C.S.A. This matter is especially urgent to the M.T.T.A. because of the very considerable number of British-made machine tools it is planned to exhibit at the Canadian International Trade Fair in Toronto next year.

Visit of Special Mission

Some electrical manufacturers are already having to deal with inquiries for equipment for this exhibition. In this connection the M.T.T.A. would like it to be known that it has available a draft report on C.S.A. requirements as far as they are understood, based on examination of the C.S.A. Code and Specifications and Hydro-Electric Power Commission inspection reports on British-made electrically equipped machine tools.

In view of the urgency and importance of this matter and as a result of discussions between the British Standards Institution and the C.S.A., it has been decided to send a small delegation to Toronto to try and clear up various matters on the spot. The delegation will consist of the following:—

Nominated by the B.E.A.M.A.: Messrs. D. Maxwell Buist, Felix Rogers and T. M. H. Stubbs.

Nominated by the M.T.T.A.: Sir Holland Goddard and Mr. W. L. Sims.

Nominated by the Cable Makers' Association: Mr. T. S. Carter.

Nominated by the B.S.I.: Mr. J. F. Stanley.

The mission will be led by Mr. D. Maxwell Buist, and Mr. J. F. Stanley is acting as organizing secretary on behalf of the British Standards Institution. The mission has the full support of the Board of Trade and the Ministry of Supply and between now and the departure of the mission early in October, meetings of the members will be held to discuss terms of reference and other pertinent matters.

Points for Discussion

The subjects the mission wishes to discuss fall under the following broad headings:—

1. To review the present arrangements for securing C.S.A. approval of industrial equipment incorporating electrical gear.

2. To review the present arrangements for securing C.S.A. approval of electrical products exported from the United Kingdom to Canada, and to discuss the possibility of securing approval before the products are shipped to Canada.

3. To expedite the approval of United Kingdom equipment pending the establishment of arrangements under Item 2.

4. To endeavour to secure amendment of certain clauses in the C.S.A. Standards and Approvals Manual which at present appear to constitute discriminatory practice.

Manufacturers interested in exporting to Canada are invited to give brief notes of any actual cases they have experienced which have led to delays, or instances of other obstacles in trying to get approval by the C.S.A. in Canada. Of particular value are C.S.A. or Hydro-Electric Power Commission of Ontario inspection reports on British-made electrical equipment or electrically-equipped machinery or other industrial equipment. These should be sent to any of the following: Mr. J. F. Stanley, British Standards Institution, 24-28, Victoria Street, Westminster, S.W.1; Mr. C. J. Jones, B.E.A.M.A., 36, Kingsway, London, W.C.2; The Secretary, M.T.T.A., Victoria House, Southampton Row, London, W.C.1; or The Secretary, C.M.A., High Holborn House, 52-54, High Holborn, London, W.C.1.

Public Lighting

PAPERS AND DISCUSSIONS AT THE A.P.L.E. CONFERENCE

LAST week's annual conference of the Association of Public Lighting Engineers, held at Llandudno, was attended by a large number of delegates and the various papers presented were keenly discussed.

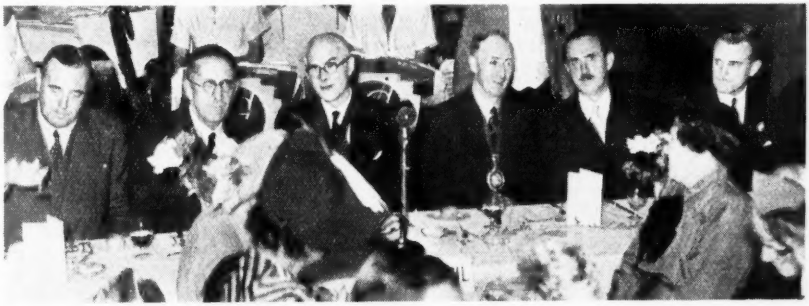
Annual Meeting

The Silver Jubilee meeting of the Association was held on 12th September and it was announced that goodwill messages had been received from the first president, Mr. S. B. Langlands, and from Captain Liberty, one of the founders.

The hon. treasurer (Mr. H. C. Brown) presented the accounts, which showed a balance of income over expenditure of £275 for the year to 31st December, 1948. The following officers were elected: *President*: Mr. A. S. Tapsfield (City of London); *Vice-President*: Mr. P. Richbell (South-Western Gas Board); *Hon. Treasurer*: Mr. H. C. Brown. There were three vacancies on the Council through retirements and a fourth was caused by the election of Mr. Richbell as vice-president. The following were elected: Mr. W. N. C. Clinch (British Electricity Authority: Eastern Division); Mr. E. C. Lennox (Wear Sub-Area, North-Eastern Electricity Board); Mr. E. Howard (Nottingham); Mr. A. Kelso (South-West Scotland Electricity Board).

Consideration was then given to a revision of the articles of association and the by-laws. The object of this was to create a new class of membership called "Group Members" to enable the new Electricity and Gas Boards to become members and to appoint individuals to represent them. At the same time the articles and by-laws were brought up-to-date and more into line with those of the senior engineering institutions. The details were explained by the president and also the solicitor to the Association. There has also been some alteration in age limits for certain classes and increases in certain subscriptions.

The President announced that the Council felt that, as this was the Silver Jubilee of the Association, the occasion should be marked by offering honorary membership to three founders who had not yet had that distinction. They were Mr. G. Shapley (Leeds), president, 1925-26; Mr. R. Davidson, president, 1926-27; and Mr. Thomas Wilkie, president in 1930-31 and again in 1947-48.



The annual luncheon of the A.P.L.E. at Llandudno. Seated (left to right) are Mr. H. F. Thompson, chairman, Streets Committee, City of London; Sir Harold Scott, Commissioner of the Metropolitan Police; Mr. A. S. Tapsfield, president of the A.P.L.E.; Councillor A. Macfarlane, chairman, Llandudno Urban District Council; Mr. F. J. Forty, city engineer, City of London and Mr. N. Boydell, South Eastern Electricity Board.

Conference Luncheon

The annual luncheon was held at the Café Royal, Llandudno, on 14th September, the principal guest being Sir

Harold Scott, K.C.B., K.B.E., Commissioner of the Metropolitan Police. Proposing the toast of "The Association of Public Lighting Engineers," he congratulated the Association on its silver jubilee and spoke of the influence of good street lighting on road safety, mentioning that in 1948 between 30 and 40 per cent of road deaths occurred during the hours of darkness. He indicated that apart from reducing road accidents, better lighting would help to reduce crime. Adequate lighting was also of great value for revealing the beauty of streets and buildings.

The President, Mr. A. S. Tapsfield, responding to the toast, paid a tribute to those who were responsible for bringing the Association into being. Speaking of road accidents, he said that apart from the heavy loss of life, it was reported that there was also an annual loss of £100 million and the position called for the closest co-operation between lighting authorities and the police.

Other toasts were "The Urban District Council of Llandudno," proposed by Mr. N. Boydell and responded to by Councillor A. MacFarlane (Chairman of the Council), and "The Guests," proposed by Mr. C. C. Smith (Liverpool) and replied to by Dr. J. N. Aldington (President-elect, Illuminating Engineering Society).

Street Lighting Economics

The first paper was read by Mr. N. Axford (Eastern Electricity Board) who dealt with "The Economics of Street Lighting" from the electrical aspect, and presented the results of his investigations in graphical form. The results were based on built-up urban areas, as costs in rural areas vary so much.

Speaking of total annual cost, Mr. Axford compared the various types of electric lighting and showed that generally some form of discharge lighting gives the most economical output for a given annual sum. An appreciable reduction in annual costs could be effected by lengthening the life of discharge lamps, and the author hoped that further research would assist in this direction.

Mr. Axford indicated that these maintenance costs could be minimized by careful organization of labour, adopting routine lamp changing and dispensing with night scouting. The design of more easily handled and more lasting equipment was also desirable.

During the subsequent discussion Mr. J. F. Colquhoun (Sheffield) said that the author's approach to malicious damage was wrong. His own policy was to inform the police. On the question of ripple control, Mr. F. S. Naylor (B.E.A.) said the author was misleading. The system was not only of interest to street lighting authorities but also to supply undertakings as it could be used for more than one purpose.

Life of Lamps

Mr. A. G. Penny (G.E.C.) thought it had been overlooked that the prime object was not that lamps should last for an indefinite period, but should have a useful life with electricity costing between 0.75d and 1.3d per kWh. It had always been the aim of manufacturers to lengthen the life of lamps, but they nevertheless had in view increasing the amount of light given.

Mr. H. W. Lodge (Halifax) suggested that the author's figures indicated too much cleaning. In an industrial area the speaker found that once every two or three weeks was sufficient. Mr. J. Woodhouse (Sheffield) considered the figures given in the paper would be limited in application as almost every authority had a different outlook. The system of lamp renewals might work in a small district but not in a large one.

Mr. R. H. Rawll (London Electricity Board) did not agree that half-night lighting gave a negligible saving because in many cases the cost of current was based on a flat rate as distinct from a two-part tariff.

Mr. L. A. Doxey (Leeds) said that in an effort to stop malicious damage notices had been inserted in the local Press and a film had been prepared. During the past two months damage had been reduced from 500 lamps to 250 lamps.

In replying, Mr. Axford said it was because of the varying charges for electricity that he had drawn his diagram in the way he had and given his own cost. Regarding malicious damage, his practice was to interview headmasters, but it was not always schoolboys who were to blame. There was necessarily a difference between the periods of cleaning in an industrial area and a residential one.

Referring to the capital cost of ripple control, he had given his own average figures for centralized control.

Specification and Code

It has often been debated whether future street lighting practice should be influenced by a code of practice or controlled by a specification, and on Tuesday afternoon Mr. F. C. Smith, of the North Thames Gas Board, presented a paper which explained the present state of affairs with regard to the subject. He assumed that the projected British Standard Specification or Code would implement the recommendations contained in the Report of the Departmental Committee on Street Lighting both in respect of design and maintenance.

It is known that the greater freedom permitted in a code has the advantage that it is of considerable assistance to the knowledgeable user, imposing less restraint upon the designer and encouraging development. However, it has the disadvantage that it is not generally acceptable as a basis of contractual obligation and it does not permit the purchaser to state his requirements with desirable precision. Whatever the ultimate document is called it is possible for the draft now in preparation to be of real service, but it is desirable for it to contain the good features of both a code and a specification.

Mr. R. S. Bradley (Southern Electricity Board), opening the discussion, said there was urgent need for a model form of contract for the erection of street lighting installations, and Mr. E. Stroud (Brighton Lighting & E.E. Co., Ltd.), remarking that it had now been generally decided that a code should be got out before a specification, said that it should not be too rigid. A specification should give guidance on fundamental dimensional matters, not be restrictive and be reviewed about every ten years.

Mr. J. W. Jones (North Western Electricity Board) said that while it was agreed that a Code of Practice or some recommended standard was necessary, in areas where most main roads ran through small towns the cost of standardized installations presented a difficult problem.

Mr. M. W. Hime (South Eastern Electricity Board) appreciated the work that had been done and said that we could go a long way by standardizing the "bits and pieces," evolving a code as a guide. When a code or a specification was going to be issued, it was vital that it should be available at the earliest possible moment and he asked the author to endeavour to speed things up.

In reply to the discussion, Mr. Smith said that the question of a model contract was outside the scope of the paper but agreed that an inherent difficulty of street lighting was that so many different organizations were often involved. The Committee had already circulated an advance specification. It had not yet been approved but he hoped that it would be issued before very long.

Equipment Developments

On Wednesday morning (14th September) the President said it had been hoped to arrange an outdoor lighting demonstration but many difficulties arose which made it impracticable. As an alternative Mr. J. A. Prowse (E.D.A.) presented a paper on "Electric Street Lighting Equipment and its Recent Developments." This was essentially a review of the exhibits which were shown at the conference and described in last week's issue of this journal.

During the following discussion Mr. G. V. Harrap (South Eastern Electricity Board) suggested that the information now available concerning street lighting should make it possible to use similar fittings and equipment in industrial establishments such as wharves and power stations. He had recently had an article published in the *Electrical Review* on this matter. There must be many other applications in industry where street lighting equipment could be used to advantage, affording greater safety to operatives and speeding up production.

Alderman J. Herbert (Burnley) expressed disappointment that no information had been given about control gear or with regard to maintenance and replacements. This would have been of interest to laymen. Councillor R. W. Brain (Coventry) asked for the author's views on the advantages of horizontal fittings with mercury vapour lamps.

Mr. André Boereboom (Brussels) said that in Belgium one of the major aims was to suppress glare. It was considered

that country roads should be so lighted as to avoid the use of motor car head lights, the intention being to mainly use cut-off lanterns.

The author agreed with Mr. Harrap and thanked Alderman Herbert for his indication of the type of information required by laymen. The point raised by Councillor Brain was a controversial one and he would not express an opinion on it. Certain light sources gave better results when burned horizontally, but usually when good results were obtained in one direction something had to be sacrificed. That was the way the whole of street lighting equipment had developed.

Street Lighting Abroad

During the past fifteen years this country has made many contributions to street lighting. The irregularity of our roads makes them difficult to light with a system demanding a rigid and regular location of lights, which leads us naturally to "tailor-made" lighting installations.

On Thursday, 15th September, Mr. J. M. Waldram, President of the Illuminating Engineering Society, delivered a lecture on "Roads Abroad and Their Lighting" which compared the characteristics of our roads with those overseas, outlining the systems of lighting employed and the various difficulties involved.

In America, he said, the cities were geometrical in plan and the roads were generally much wider than ours. Most of the streets were not well lighted by our standards and there was a good deal of glare. South African and Australian towns had similar problems due to the wideness of the streets. A special difficulty in the former country was severe corrosion of fittings, and apart from this enclosed lanterns had to be completely insect-proof.

On the Continent the roads were much like ours, but the buildings were different and the numerous blocks of flats involved street lighting problems many of which still had to be solved. The most marked difference between our ideas and theirs, especially in Holland and Germany, was the insistence on avoiding glare, which led to the cut-off system.

The non-cut-off system had proved its capabilities in this country, but people were becoming more critical of its glare. Public lighting engineers had many fields to conquer, in collaboration with the road constructors and lamp makers, and it would be interesting to see which way they should go.

Lighting and Aesthetics

The closing meeting of the conference was held on Friday morning, when Monsieur L. Gaymard (Chief Lighting Engineer, Paris) gave a lantern lecture on "Public Lighting and Aesthetics." He felt that the study of the aesthetics of street lighting should lead to economy and that technical evolution and improvement naturally led to the production of handsome work.

He emphasized that aesthetic problems of day and night were not identical and he urged the need for the closest co-operation between architects, builders, lighting engineers and lighting authorities. In support of his contentions he showed a large number of lantern slides depicting lamp columns and brackets and overhead wire systems in various parts of the world which he thought had far too many embellishments and so far as lamp columns and brackets were concerned were extremely heavy in design. He also advocated the prohibition of sodium and mercury vapour lighting in certain places because of the effect on human faces and also on goods in shop windows. Similarly, he would prohibit luminous signs in residential areas.

In contrast, examples were shown of lighting standards and brackets which were pleasing and fitted in well with the surrounding architecture. Monsieur Gaymard maintained that it was not necessary to abandon standardization in this matter and suggested that all those concerned with street lighting throughout the world should get together and endeavour to lay down fundamental rules which would enable modern installations to be applied with due regard to the circumstances in particular cases.

Electricity Output

DURING the week ended 9th September, 758.8 million kWh was sent out for public supply from solid-fuel-fired stations of the B.E.A. and North of Scotland Hydro-Electric Board. In the previous week the output was 751.1 million kWh and in the week ended 10th September, 1948, 720.4 million.

Commerce and Industry

First Effects of Sterling Devaluation
Engineering Unions' Wage Claim

THE Chancellor of the Exchequer (Sir Stafford Cripps) announced last Sunday that it had been agreed at the Washington Conference between Great Britain, the United States and Canada that the value of the pound sterling should be fixed at the new rate of $2.80.

An immediate result of this was a general advance in the values of ordinary industrial shares while gilt-edged stocks declined. The Ministry of Supply suspended dealings in copper, lead, zinc and aluminium until Thursday when new prices were to be announced. The price of rubber was increased by about 2d a lb.

Several other countries announced their intention to devalue their currencies, among them Canada, Australia, Belgium, South Africa, Norway, Sweden and France. Argentina, Brazil and Switzerland are maintaining the existing dollar exchange rates and Italy has adopted a day-to-day basis dependent upon the free market values.

Engineering Wages Claim

The Confederation of Shipbuilding and Engineering Unions has decided to present a claim for an increase in wages of £1 a week for adult male workers in the industries covered, with proportionate rises in the wages of younger workers. Proposals for a new wages structure and increases of 13s a week for craftsmen and 4s a week for labourers are already under consideration by the employers' federation. It has been estimated that the granting of the £1 a week increase would cost about £100 million a year.

Electrical Commercial Travellers

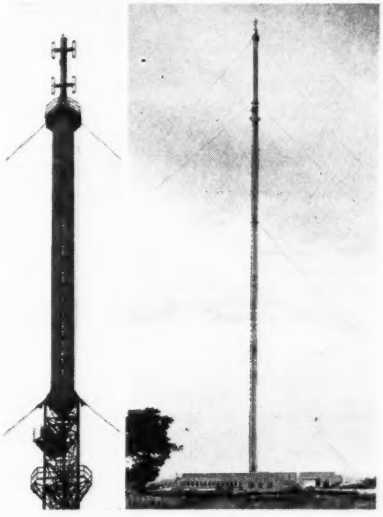
The annual dinner and dance of the Electrical Trades Commercial Travellers' Association will be held on 7th October at the Café Royal, London. W.1. Tickets (25s each) can be obtained from Mr. L. A. Fickling, hon. entertainments secretary, c/o Linolite, Ltd., 158, Bishopsgate, London, E.C.2.

Operational Research

The Manchester Joint Research Council has organized six meetings on "Operational Research." The meetings will be held at the Manchester Chamber of Commerce, Ship Canal House, King Street, Manchester, 2, at fortnightly intervals, commencing on 30th September. The fee for the full series is 30s, and applications for tickets should be made to the Secretariat, The Manchester Joint Research Council, c/o the Manchester Chamber of Commerce.

Sutton Coldfield Transmitter

The accompanying photograph shows the transmitter building and the 750ft mast at the B.B.C. television station under construction at Sutton Coldfield. At the top of the mast is the single wide-band aerial, consisting of two tiers of four vertical folded dipoles in cruciform arrangement, which will radiate both sound and vision signals. The



Television aerial at the new Sutton Coldfield transmitting station

cylindrical structure below the television aerial is connected with B.B.C. proposals to broadcast at very high frequencies.

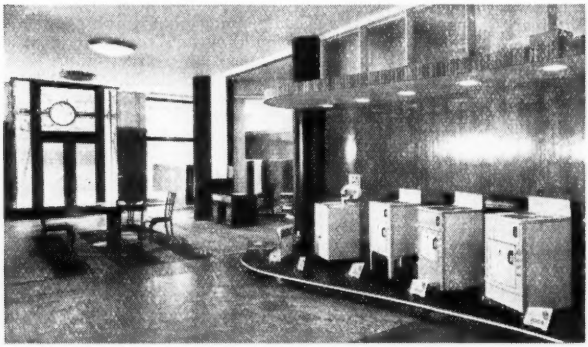
Tube Investments in South Africa

Tube Investments, Ltd., announces the formation of a new subsidiary, T.I. South

Africa (Pty.), Ltd., to assist generally in the promotion of the business interests of its subsidiary companies in that country. Major-General Sir Francis de Guingand has been appointed resident chairman and managing director of the company. Tube Investments has also acquired the factory, plant and equipment of the Ace Cycle & Engineering Co., Ltd., of Springs, near Johannesburg.

English Electric London Showrooms

Extensive showrooms have recently been reopened by the English Electric Co., Ltd., inside the entrance of the company's London office, Queen's House, Kingsway, W.C.2. The displays of the company's products will be changed from time to time, the present display dealing with domestic appliances.



The showrooms of the English Electric Co. at Queen's House, Kingsway

Contract Price Adjustment Formulæ

The following are the latest figures for use in the B.E.A.M.A. contract price adjustment formulæ: The rate of pay for adult male labour at 10th September is deemed to be 115s (unchanged). Cost of materials: The Board of Trade index figure for intermediate products at 10th September is 257.0, and is the figure for the month of August (against 256.9 for July).

"Board Helps Contractors"

In the leaderette with this title in our issue of 9th September we referred to the Birmingham contractors. Actually the contractors concerned were those of the E.C.A. Manchester Branch.

Manchester Engineering Courses

The Manchester and District Advisory Council for Further Education has published a guide giving particulars of the facilities available for courses in engineering in the Manchester area, and also a booklet relating to most advanced lectures in electrical and mechanical engineering. Copies of these publications can be obtained from the Education Offices, Deansgate, Manchester, 3.

Lighting Lectures

A course of lectures on electric lighting is being given at the electricity showrooms, Cleethorpes, on Wednesday evenings until 26th October. The course has been arranged by the Lighting Service Bureau in co-operation with the Yorkshire Electricity Board, No. 7 Sub-Area, Grimsby. The first lecture was given on Wednesday last.

Radar Research

The Ministry of Supply's Radar Research and Development Establishment at Malvern, which is responsible for the research into and development of Army radar equipment, is holding an exhibition this week. More than one hundred items of equipment are on view, including radar sets for detecting ground movements and enemy mortars, radar-controlled searchlights and lens aerials. There is a demonstration of a heavy anti-aircraft troop firing by radar, while various models and other demonstrations explain the way in which radar works. A film on the history of the establishment is also being shown. The exhibition closes to-day (Friday).

Domestic Appliance Exports

We are informed by H. Fisher (Oldham), Ltd., that among orders received by them from overseas are 1,000 washing machines for New Zealand, 1,000 "Cleanettes" and 2,000 washing machines for Australia, and 1,000 "Cleanettes" for Argentina.

Radiovisor Coming-of-Age

On 15th September the Radiovisor Parent Co., Ltd., celebrated its twenty-first anniversary by arranging a special demonstration of the many applications of its photo-electric and electronic control equipment at 1, Stanhope Street, London, N.W.1. The company claims to be the pioneer firm in the design and manufacture of industrial photo-electric equipment;

its burglar alarm was first used at a public exhibition for the protection of silver in 1929. The apparatus demonstrated last week included burglar alarms, counting units, industrial smoke density indicators, street lighting control, photo-electric equipment and automatic controls for a variety of purposes.

Melting High-Duty Alloys

A Scottish firm has received permission from the B.o.T. to import an American electrical furnace for the induction melting of high-duty alloys. When the installation is completed in some six months' time, it will be one of the most modern of its type in Europe and will permit a considerable expansion in the firm's work. This development links up with the gas turbine and jet propulsion field in so far as the production of metals able to operate under extremely strenuous conditions has been limited so far by the capacity of existing plant.

This installation will ensure to the West of Scotland facilities for the production of alloys as well as for their fabrication. The work now proceeding in Scotland includes experimental marine work on gas turbines and the construction of a set at John Brown and Co., Ltd., Clydebank, for the North of Scotland Hydro-Electric Board. There is also a project on foot, using gas turbines, for the conversion of Scottish peat into electrical energy.

C.P. Exhibition at Carlisle

An exhibition of industrial and commercial electrical equipment is to be opened on Tuesday next, 27th September, at the Crown and Mitre Hotel, Carlisle. Arranged by Crompton Parkinson, Ltd., it will give local business executives and managers and electrical traders an opportunity of seeing the latest developments in electrical equipment for promoting industrial and commercial efficiency.

Outstanding features of the exhibition will be Nelson stud welding, electric motors, switchgear, cables, instruments and fluorescent lighting fittings. The exhibition will remain open until 30th September. Crompton Parkinson specialists will be in attendance to demonstrate the exhibits and give any information required.

London Contractors' Dinner

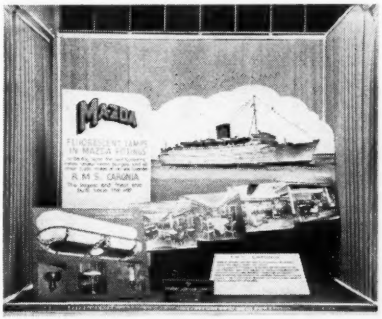
The annual dinner of the London Branch of the Electrical Contractors' Association is to be held on 1st November at Grosvenor House, Park Lane, London, W.1.

Import Licensing Department

The Import Licensing Department of the Board of Trade (with the exception of the Machinery Section and the staff dealing with European Recovery Programme claims) has been transferred to Romney House, Tufton Street, Westminster, S.W.1 (telephone: Abbey 9080). The Machinery Section and the staff dealing with E.R.P. claims will remain at 91, Victoria Street, S.W.1.

New B.T.H. Window Display

Ship lighting is the theme of an attractive B.T.H. window display now on view at Crown House, Aldwych, London. It deals with the r.m.s. *Caronia*, in which "Mazda" lighting is installed in all the public rooms. Reference is made to B.T.H. research work in devising a new technique in the use of fluorescent lamps



The latest B.T.H. window display at Crown House, Aldwych, London, featuring "Mazda" lighting in the r.m.s. "Caronia"

which gives entirely satisfactory colour rendering while maintaining high efficiency. There is a large-scale photograph of the *Caronia* itself and the foreground is taken up by more photographs showing some of the specially designed "Mazda" fittings, together with four views of some of the rooms on board, showing the excellence of the installation.

Bristol College and Faculty

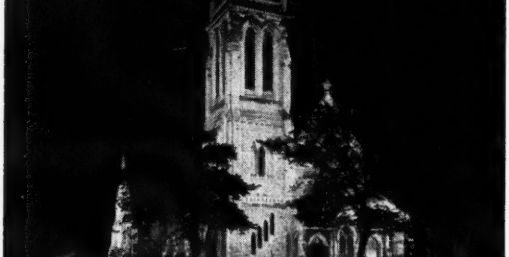
As from 1st September the Society of Merchant Venturers ceased to be responsible for the administration of the College and Faculty, Bristol, and the title Merchant Venturers' Technical College has been discontinued. The administration of the Faculty is now carried on as for the rest of the University and is entirely separate from that of the College. The premises are being sold to the Corporation of Bristol, certain parts being leased to the University of Bristol for the use of the Faculty of Engineering. The construction of new independent premises to house the Faculty

on the main University site is shortly to begin.

The College is now known as the College of Technology, and the part leased to the University, as the University Engineering Laboratories. The Department of Commerce of the Merchant Venturers' Technical College becomes an independent college, also under the control of the corporation of Bristol, known as the College of Commerce, Bristol.

Architectural Floodlighting

As there was no "live" demonstration of public lighting equipment in conjunction with the recent conference of the Association of Public Lighting Engineers, Holy Trinity Church, Llandudno, was floodlit by No. 5 District Office of the Merseyside and North Wales Electricity Board using Philips "Reigate" 140 W sodium floodlights. Other Philips sodium installations at Llandudno included the floodlighting of the Cenotaph, Town Hall, Public Library, St. John's Methodist Church, the North Western Hotel and St. George's Hotel, which was used as the conference headquarters.



Holy Trinity Church, Llandudno, illuminated by Philips 140 W sodium floodlights

Distribution Technique

The Incorporated Sales Managers' Association announces that National Sales Executives (an American Association) has accepted an invitation to hold, in London next February, a joint conference on techniques of distribution. Sales managers in Britain believe that the attempt to double the sales of British goods in U.S.A. cannot succeed until many sections of our industry are prepared to relate their production planning to the requirements of dollar markets.

A current example of our backwardness in this matter is the setting up of an Anglo-American Productivity Council without a sales member. The conference will be an open one and all organizations which are actively interested in the sale of British goods in dollar markets will be invited to co-operate.

Catalogues and Lists

Simplex Electric Co., Ltd., Broadwell, Oldbury, Birmingham.—Priced leaflet on steel conduits.

Metway Electrical Industries, Ltd., King Street, Brighton, 1.—Priced card on automatic and non-automatic electric kettles.

Steatite & Porcelain Products, Ltd., Stourport-on-Severn. — Illustrated leaflet providing a brief description of i.v. insulators and refractories.

Courtney Pope (Electrical), Ltd., Amhurst Park Works, Tottenham, London, N.15.—Illustrated, priced leaflet on the "Amhurst" "Perspex" trough fluorescent lighting fitting.

The Airscrew Co., Ltd., Weybridge, Surrey. — Illustrated folder describing the company's new dust collection and fume extraction unit.

A. W. Hunt, Ltd., Bendon Valley, Garratt Lane, Wandsworth, S.W.18. — Illustrated service trade catalogue and leaflet on dry electrolytic capacitors.

Brookhirst Switchgear, Ltd., Northgate Works, Chester.—Illustrated booklet dealing with the control of material handling plant.

General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.—"Osram" lamp leaflet No. OS.894.

Osram Valve and Electronics Department

The General Electric Co., Ltd., announces that, in view of the widespread scope of its operations, the department previously known as the Osram Valve Department will in future be known as the Osram Valve and Electronics Department.

Smoke Abatement

The annual conference of the National Smoke Abatement Society will be held at Harrogate from 29th September to 1st October. Over 400 delegates will attend, and the proceedings will include addresses by Lord Simon, the retiring president, and

Dame Vera Laughton Matthews, the new president, who will be the first woman to hold the position.

Controls on "Brabazon I"

Brabazon I, the world's largest civil plane, is the first aircraft to fly with all-electric throttle controls. The eight Bristol Centaurus S.M.20 engines are fitted with Evershed throttle controls, Type 2, which provide absolute synchronism of movement since all the slave units on the engines move at exactly the same speed as the control levers. Control may be effected individually or in pairs at the flight engineer's station, or in pairs by the pilot. Mechanical linkage between the pilot's and the flight engineer's stations is such that when the pilot brings his levers back through the slow-running positions, continued movement in the same direction reverses the pitch of the propellers and increases the throttle opening to that for maximum reverse revolutions. Except when the propellers are used for braking, as just described, their pitch is set by Evershed variable pitch propeller controls, Type 2, which are very similar to the throttle controls. Both controls are manufactured by Evershed & Vignoles, Ltd., at their Chiswick works.

Soil-Warming Installation

A consumer at Wisbech has ordered from the Eastern Electricity Board an additional 108 kW of soil-warming equipment, making the total installed loading in his glass-house 145 kW. It is believed that when complete this will be one of the largest electric soil-warming installations in the country.

Trade Announcements

British Mechanical Productions, Ltd., and their subsidiary, the **General Accessories Co., Ltd.,** announce that they are no longer subsidiary companies of Radio & Television Trust, Ltd.

Cinema-Television, Ltd., and **Dawe Instruments, Ltd.,** have opened an Electronics Centre at 83, Piccadilly, London, W.1 (telephone: Mayfair 4613).

Time Switches & Instruments, Ltd., has opened offices at 5, Victoria Street, London, S.W.1 (telephone: Abbey 6903) for home and export sales. Accounts and service matters will still be handled from Bovey Tracey.

Canada's External Trade

The *Monthly Review* of the Bank of Nova Scotia for August contains an article on "The Changing Pattern of External Trade." In the course of this it is said that the most disturbing losses of markets are those for such Canadian goods as automobiles and tyres, electrical appliances, machinery and farm implements, both because such markets have been important in the past and because Canadian capacity to produce metal products and machinery has expanded markedly. There is good reason to believe that the manufactured goods which have been going to the Dominions and Colonies are thoroughly competitive. They have frequently been replaced, however, by higher-priced British and domestic goods behind the barriers of exchange controls and import restrictions.

On the side of imports, there has been little readjustment in sources of Canadian imports of a kind which would assist Canada's overseas customers in maintaining their purchases from the Dominion. Some overseas countries, and particularly Britain, have considerably increased their sales to Canada in the past two years, but the fact remains that they have not nearly regained their pre-war share of the Canadian market, let alone the increased share needed to help the payments problem. In the first half of 1949, the sterling area provided only 18 per cent of Canada's imports as compared with 27 per cent before the war.

National Supply Suryey

We regret that a transposition of names occurred under the portraits of the South Eastern Electricity Board "team" in our survey of the South Eastern Area last week (p. 513). The third portrait was that of Mr. W. A. Gallon (the chief engineer) and the fourth Mr. A. L. Burnell (the secretary), not *vice versa*.

Change of Address

Contactor (Pty.), Ltd., informs us that it has moved from Cape Town to Zuider Paarl, Cape Province, South Africa. (Telegrams: "Thermostat, Zuiderpaarl.")

Change of Name

M.C.L. & Repetition Co., Ltd., has changed its name to W.J.M. Holdings, Ltd.

Information Department

THE extensive records of our Information Department enables us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

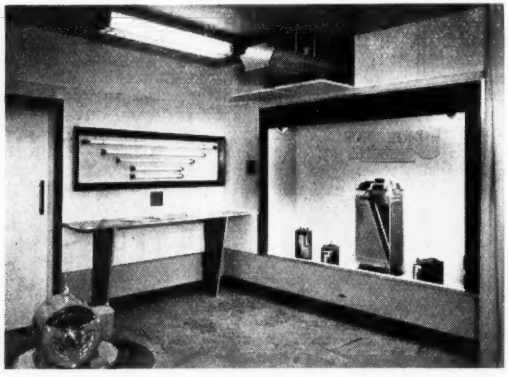
"Ellison" radio transformers.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Lighting Demonstration Methods

NEW CROMPTON PARKINSON SHOWROOM

A SHOWROOM for the exhibition of lighting equipment, and typical motors, instruments, meters, batteries and rubber cables, was opened on 1st September by Crompton Parkinson, Ltd., at Crompton House, Aldwych, London, W.C.2. It is intended as a convenient centre for the demonstration of the latest techniques of interior and display lighting, and the showroom layout has been mainly designed for this purpose.



A section of the new Crompton Parkinson showroom

New types in the range of Crompton fluorescent lighting fittings are displayed either as permanent fixtures or by withdrawing each separately for inspection from a series of compartments in which they are normally concealed. With this arrangement each fitting can be viewed individually. It also keeps the main part of the ceiling free for observation of the illumination obtained with the indirect lighting schemes installed. Different parts of the showroom can be lit by selected forms of lighting equipment arranged to represent typical schemes.

One section of the ceiling has an inset lattice-louvre screening fluorescent tubes. By selective switching of tubes, the intensity of the lighting can be varied for different occasions. The arrangement provides for low intensity lighting during the viewing of television to avoid the eyestrain that results from looking at the screen against the harsh contrasts of an unlit room. Indirect lighting is demonstrated by two separate schemes, one using fluorescent tubes in cornice fittings and the other fluorescent tubes and reflectors concealed in wall recesses.

To illustrate the problems that arise in the planning of lighting installations, and the methods of solving these problems, various simple demonstrations have been arranged. One of these shows how necessary it is to have interior reflecting surfaces of the correct colour. The effect of the colour of the light on the colour of the objects viewed is demonstrated in colour comparison cabinets. With this apparatus various types of lamps can be tried out to ascertain which will provide the colour values required. Other demonstrations show the application of directional lighting to reveal form, and the importance of correct intensity lighting for the clear observation of the detail of moving objects. A separate section of the showroom contains a range of industrial fittings for filament and discharge lamps.

A slide projector is installed for showing typical industrial, commercial and shop-window installations planned by the company's lighting department.

"Hot Glass" in Steamship

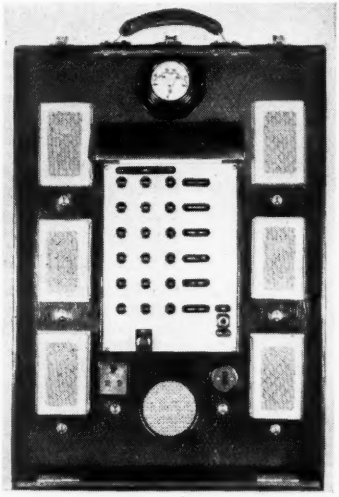
TO ensure clear vision even in wintry conditions of sleet and snow, "hot glass" has been fitted to the wheelhouse of the s.s *Princess Norah*, of the Canadian Pacific's British Columbia Coast Steamship Services. The "hot glass" is the Libbey-Owen Ford Co.'s "Electrapane," which is given heat conducting properties by a coating of oxide only 0.0002 in thick through which current is fed to the glass surface by thin electrodes concealed along the edges. No wires appear in the window. "Electrapane" was developed during the war under secret orders from the U.S. Army, but its use commercially for de-fogging and de-icing purposes is only recent. The Pilkington Glass Co. of Canada, through its Vancouver agency, installed the wheelhouse window.

RECENT INTRODUCTIONS

Notes On New Electrical and Allied Products

Remote Temperature Indicator and Fire Alarm

AN instrument which acts both as a "fuel watcher" and a fire alarm has been developed by HARTLEY ELECTROMOTIVES LTD., Shrewsbury. The "Thermalarm" remote temperature indicator and fire alarm



"Thermalarm" apparatus arranged for demonstration purposes, showing central panel and six sensitive elements which in practice would be placed in selected positions throughout a building

system gives visual indication on a central panel by means of green and amber lights if the temperature at selected points in a factory, office, etc., is too low or too high, while red lights and an audible warning show if the temperature has reached a dangerous level. Once started, the fire warning will continue even though the wiring in the vicinity of the fire is destroyed. The temperature indicating system can be switched off at week-ends, etc., leaving the fire alarm operative.

The three-stage thermostats which form the sensitive elements are readily set to any desired temperatures and can be wired in series to give floor-by-floor coverage or in any other combinations. The standard central panel provides for indication from six points; larger numbers of positions can be covered by employing two or more units.

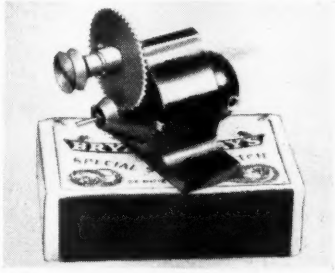
The apparatus can be used to give warning just before a sprinkler system operates and so prevent possible damage by water. It can also be adapted for use as a burglar alarm or to indicate humidity. Air conditioning, processing work, malt conditioning in breweries and the indication of the temperature of bearings are other possible uses for the equipment.

The "Thermalarm" costs approximately £8 per station to install.

Miniature Electric Motor

A small, instantly reversible, electric motor has recently been placed on the market by Victory Industries (Surrey), Ltd., Barfax Works, Worplesdon Road, Guildford, Surrey. Precision built, the "Mighty Midget" is more than a toy and can be put to a variety of uses, notably for models of all kinds, constructional sets, etc.

An unusual feature is the absence of rapidly revolving iron parts. The iron losses caused by hysteresis and eddy-currents are minimized by the use of a patent "floating core." The armature windings are made up on a hollow cylindrical plastic former, firmly mounted on a small gauge steel spindle, and within the former a soft iron core is mounted on the spindle in such a way that it is free to revolve. When current is passing through the motor, the



"Mighty Midget" electric motor

windings and spindle revolve rapidly while the "floating" core revolves much more slowly.

Energised by a 3 V battery, although up to 4.5 V can also be used, the consumption is of the order of 100 mA and the normal spindle speed, driving its countershaft, but without external load, is about 10,000 r.p.m. A ring-shaped "Alnico" permanent magnet is employed as the field, the drive being applied from a small pinion on the spindle to a large brass gear-wheel.

The motor, which is totally enclosed in a neat plastic case and supplied complete with accessories comprising countershaft, 6.25 to 1 reduction gearing and two pulleys, retails at 14s 3d including tax.

Push-button Switches

As a development of their "S600" range, ARCOLECTRIC (SWITCHES), LTD., Central Avenue, West Molesey, Surrey, have

Arcolectric biased push-button switches

brought out a new range of push-button switches, all with quick make-and-break biased action. Single- and double-pole types, both single- and double-throw, are available.

Improved Teleprinter

A new company, the COOPER TELEPRINTER CO., LTD., 139, Kensington High Street, London, W.8, has recently been formed to develop, manufacture and market an improved type of teleprinter. This machine is claimed to be capable of operating at speeds in excess of the normal line working limited only by the operator's speed. The standard model is adjustable to function at 66.6, 100 and 133.2 words per minute, but it is able to work at speeds of up to 240 words per minute if necessary.

Most machines are capable of accepting signals with a distortion of about 35 per cent, but the company claims that its new machine will accept and print with accuracy signals with a distortion of up to 45 per cent, the maximum possible being 49.99 per cent. Machines are supplied to work on either simplex or duplex systems and one of them will also work in conjunction with any other teleprinter system.

New Zealand Imports

IMPORTS of electrical goods into New Zealand last year increased in value except for radio material. Little detail is yet available but the accompanying table shows the comparable values in 1947 and 1948 of the main groups.

Class	1947 £(000)	1948 £(000)
Storage batteries	33	29
Ranges	—	4
Lamp bulbs	80	136
Other elec. machinery and equipment	6,647	7,049
Radio sets	13	6
Radio valves	142	91
Other radio apparatus	326	288

The rationing of electric power in the Dominion was necessary last winter but was eased by the introduction of new generating capacity. Additional power is planned from the Clutha River, South Island, where a 300,000 kW hydro-electric station has been decided on. By 1957 it is intended that the electrification of the main railway between Auckland and Wellington shall be completed.

The Minister of Works, in reporting progress recently on the installation of the additional 10,000 kW generators at the Cobb River project, South Island, said that completion in 1952 was probable. A 25,000 kW machine from Britain is expected to be operating at Tekapo by 1950.

The Minister in Charge of the State Hydro-Electric Department stated a week or two ago that progress was better than had been expected on both the Waikato River and the Maraetai schemes. Work was also progressing well on New Zealand's biggest hydro-electric project at Roxburgh on the Clutha River (320,000 kW). The whole job might take seven years and the total cost would be £17,000,000. He said that the Government was now spending £6,000,000 a year on hydro-electric schemes and £8,000,000 a year would be spent when work developed at Roxburgh. He claimed that the country had the largest number of electrified homes in the world and the cheapest electricity in the world, apart from Canada.

Electricity Supply

Long Overhead-Line Span : Blackpool Illuminations Switched On

RECENTLY the conductors were changed on what is known as the "Long Span." This is a 33-kV overhead line running between Salterhebble and Greetland, in the Yorkshire Electricity Board's area, the single span being 2,000ft in length. The original conductors, which were of steel cored aluminium, were installed in 1929. These have been replaced by cadmium copper conductors purely as a precautionary measure. Special arrangements had to be made as the overhead line crosses a railway line and two main roads. The line is the main supply to the Calder Valley.

Payment for Mains

It was reported to Dover Housing Committee last week that the South Eastern Electricity Board proposed to charge the Corporation for the installation of mains on the Buckland housing estate. The borough engineer (Mr. P. V. Marchant) added that the Gas Board was still prepared to lay mains without charge and he considered that they were "being held up to ransom" by the Electricity Board. The practice of charging for the installation of electricity mains had only come into force in the last few months; previously they had been installed free of charge by the undertaking.

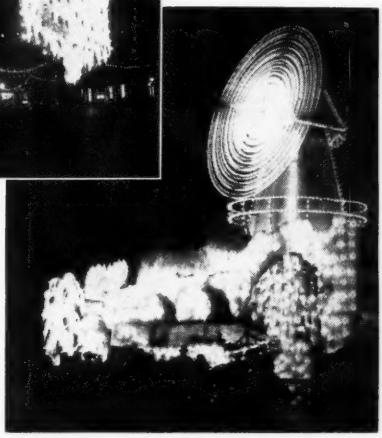
The proposed charges varied according to the form of cooking adopted. In one case where 124 houses were being built, the Board would charge £969, if electric cookers and wash boilers were installed, which worked out at roughly £7 16s per house. With half the houses so equipped the charge would be £2,139, or £17 5s per house, while if the tenants were given a free choice the charge would be £3,339 (£26 18s per house). Those figures did not include service connections, for which £771 had been included in the bill of costs. It was decided that the town clerk should investigate the position.

Connah's Quay Scheme

It is expected that work on the new electricity power station at Connah's Quay (Deeside) will be started within the next six months.

Charges in Aberdeen

Following the increase of charges in Aberdeen by the North of Scotland Board last year, the Corporation sought counsel's opinion on the validity of the Board's procedure, and was advised that the Board had exceeded its powers. The Special (Electricity Charges) Committee of



Illuminations at Blackpool. The photograph on the left was taken looking north from Manchester Square towards the tower along the festooned tram track. Right: Illuminated windmill on the promenade at Manchester Square

the Corporation also received a memorial from the Board with counsels' joint opinion that the increases were imposed in accordance with the relevant regulations and were legally valid. The Committee has now recommended that no further action should be taken in view of the doubt over the legal position. One member disassociated himself from the recommendation.

Electrical Equipment Preferred

At a recent meeting the Wantage Urban District Council accepted a tender from the Southern Electricity Board for the supply of cookers at £18 14s 6d each and wash-boilers at £7 13s 6d each for installation in houses to be built on the Barwell Road site. Underground distribution with free services was offered by the Board on the condition that the tenants were allowed a free choice of appliances. The Southern Gas Board's terms for cookers and wash-boilers were £20 15s 6d and £3 6s respectively, service pipes to be laid free of charge.

A view of the turbine house at the new Croydon "B" power station, showing the progress of construction. Initially there will be four 52.5 MW turbo-alternators and eight 320,000 lb/hr boilers

Provision of Refrigerators

Huyton-with-Roby (Lancs) Urban District Council has decided to install refrigerators in old and new Council property. In new houses there will be no installation fee, but for installations in old dwellings there will be a charge of 30s to £2. Rental will be about 1s 3d per week.

Electric Cooking

Crewe Housing Committee has agreed to place an order for 248 electric cookers at a cost of £4,580.

Frome Urban District Council decided on 5th September that electric cooking and heating facilities should be provided in all houses on the Woodland Road site. This decision followed upon the report by the Council's surveyor on the result of an inquiry made among the tenants of 37 houses recently occupied.

Municipal Electrical Work

A sub-committee has been appointed by Sunderland Town Council to consider the formation of an Electrical Department. At present electrical work is supervised by Mr. F. Harland, an electrical engineer in the Borough Engineer's Department. With electrical work increasing, especially in view of the council's illuminations at Seaburn and Roker, it is felt that there is need for a separate department.

S.W. Rural Supplies

At a meeting between the Bridgwater R.D.C. and the S.W. Electricity Board it was stated that the Board was now taking steps to ascertain the probable demand for electricity and that the investigations would be completed within two years. The Board added that it was not considered economical or in the interests of consumers to deal with individual parishes as separate schemes, but rather that development should await the preparation of the scheme for the whole area.

Swansea Guildhall Offices

The South Wales Electricity Board has agreed to vacate the offices in Swansea Guildhall formerly used by the Corporation electricity undertaking. For relinquishing its legal right in the offices the Board is to receive £5,000 from the Corporation and for the surrender of rights in the furniture and equipment £750.

Sodium Lighting

By the casting vote of the Mayor, sodium lighting has been chosen for about eight miles of main roads through Swinton and Pendlebury. Before making the decision members of the Highways and Lighting Committee had visited various towns to inspect different types of lighting, and many favoured the fluorescent system. Part of the A6 road at Worsley is also to have sodium lighting, and it is also to be installed on the A666 road at Kearsley and Farnworth.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

Thorn Electrical Industries, Ltd.—The annual meeting was held on 16th September when Mr. Jules Thorn (chairman and managing director) reviewed the year's trading. The decrease in profit, he said, reflected the extremely difficult conditions which had prevailed throughout every section of the industry in which they were engaged. On the lighting side there had been considerably increased competition and the high rate of purchase tax on radio receivers, together with the uncertainty in the months preceding each year's Budget, made this part of their business extremely difficult.

Ever-increasing difficulties had been experienced in overseas markets. Large orders obtained were subsequently made valueless by the refusal of the respective Governments to grant licences; in many cases shortage of sterling prevented export customers from opening their letters of credit. In addition, fierce competition had brought prices down. In view of the uncertainties lying ahead the board had decided to revert to the pre-1947 policy of 20 per cent dividend.

They were working hard on the television development programme and had introduced an 18-valve table model. Great strides forward had also been made in fluorescent lighting.

Kelvin & Hughes, Ltd.—A substantial increase in turnover was recorded by Sir Frederick C. Stewart (chairman) at the annual meeting on 15th September. This achievement, he said, was particularly satisfactory in view of the difficulties which were an all-too-common feature of present-day trade. He referred especially to the restrictions applied by other countries on imports, which it appeared might remain for some considerable time.

Telephone Properties, Ltd., reports a net profit for 1948 of £24,056, as compared with £14,186 for the preceding year. The ordinary dividend for the year is maintained at 6 per cent.

The East African Power & Lighting Co., Ltd., reports an income for 1948 of £273,218 as compared with £240,648 for 1947, and after providing for depreciation, etc., a net revenue, before tax, of £158,910 (against £147,149). Taxation absorbs £2,146, general reserve receives £30,000, and development reserve £10,000. As already announced the ordinary dividend for the year is maintained at 7 per cent, and £73,419 is carried forward (against £71,588 brought in).

C. A. Parsons & Co., Ltd., are maintaining the interim ordinary dividend at 5 per cent, less tax, and in addition propose a jubilee bonus of 2½ per cent. The sum of £15,000 is distributed to employees as a special diamond jubilee bonus.

Eveready (South Africa), Ltd., report a net profit for the year ended 30th June last of £118,770, as compared with £73,078 for the preceding year. The dividend for the year is 30 per cent as compared with 22½ per cent for 1947-48 paid by Eveready South Africa (Proprietary).

Peto Scott Electrical Instruments, Ltd., reports a consolidated net profit for the year ended 31st March last of £7,625, as compared with £8,082 for the previous year, and the net profit of the holding company is £7,052 (against £5,295). The ordinary dividend for the year is 7½ per cent (against 12½ per cent) and £20,830 is carried forward (against £15,634 brought in).

The Automatic Telephone & Electric Co., Ltd., proposes to issue 315,621 £1 ordinary shares, the unissued balance of its share capital, to ordinary and deferred stockholders at 50s per share in the ratio of three shares for each £10 of ordinary or deferred stock held on September 9th.

The London Electrical & General Trust reports revenue for the year to 30th June of £63,607 (against £67,379), with a net balance of £23,504 (£25,431). The final ordinary dividend of 4 per cent again follows an interim of 2 per cent; reserve receives £5,000 (£5,564) and £18,570 (£18,381) is carried forward.

British Ropes, Ltd., is paying an interim dividend of 3 per cent. This compares with 5 per cent last year, but is paid on doubled capital, a 100 per cent capital bonus issue having been made in July to ordinary stockholders.

The Anglo-Portuguese Telephone Co., Ltd., reports a revenue for 1948 amounting to £837,149, compared with £752,948 in 1947. Operating expenses totalled £711,565 (£642,664). The net profit rose from £57,812 to £60,473. A final dividend of 5

per cent (same) again makes the total distribution 8 per cent on the ordinary shares, the dividend on the "A" ordinary also being 8 per cent. The carry-forward is raised from £42,732 to £46,033.

The British Aluminium Co., Ltd., has declared an unchanged interim dividend of 4 per cent.

The Watford Electric & Manufacturing Co., Ltd., is paying an interim dividend of 5 per cent (unchanged).

New Companies

I.X.C., Ltd.—Registered 9th September. Capital £1,500,000. To acquire the main undertaking of International Combustion, and to carry on the business of designers, manufacturers and builders of and contractors for and constructional engineers for power plants of all kinds, including the equipment and maintenance; to carry on the business of mechanical, consulting, civil, constructional, agricultural and general engineers; gas, petrol, electrical, light and power and hydraulic engineers, etc. Subscribers: E. J. York and W. H. Barnes. Regd. office: 19, Woburn Place, W.C.1.

Farey & Horne, Ltd.—Registered 7th September. Capital £1,500. Manufacturers, hirers and repairers of and dealers in radio and television receivers and transmitters, rediffusion and electrical equipment, etc. Directors: L. Farey and W. R. S. Horne. Regd. office: 86, Regent Street, Leamington Spa.

Neon Installations, Ltd.—Registered 6th September. Capital £1,000. Manufacturers of and dealers in illuminated gaseous discharge tubes, transformers and control equipment, and all fittings and apparatus required in connection therewith, manufacturers of signs, electrical engineers, etc. Directors: S. Dickinson and H. Widdall. Regd. office: 24, Fountain Street, Manchester, 2.

J.G.R. Developments, Ltd.—Registered 1st September. Capital £100. To acquire patents, licences and concessions, relating to wireless or television, etc. Directors: J. H. Williams, J. C. G. Gilbert and R. S. Roberts. Solicitors: Langlois Harding & Co., 170, Bishopsgate, E.C.2.

Increases of Capital

G.E.T. Installation Co., Ltd.—Increased by £2,500, in 2,500 preference shares of £1, beyond the registered capital of £2,500. The existing 2,500 shares of £1 have been subdivided into 50,000 ordinary shares of 1s each.

B.C.S. Electrics, Ltd.—Increased by £3,000, in £1 shares, beyond the registered capital of £3,000.

Midland Electric Manufacturing Co., Ltd.—Increased by £300,000 in £1 ordinary shares, beyond the registered capital of £225,000.

Telegraph Construction & Maintenance Co., Ltd.—Increased by £603,600, in £1 ordinary shares, beyond the registered capital of £896,400.

Murphy Radio, Ltd. — Increased by £250,000, in £1 five per cent cumulative preference shares, beyond the registered capital of £800,000.

Belco London, Ltd.—Increased by £40,000, in £1 shares, beyond the registered capital of £10,000.

Winding-up Petition

In the Vacation Court on Wednesday, 14th September, before Justice Devlin, the hearing was resumed of the petition by McCready's Metal Co., of Pentonville Road, London, for the compulsory winding-up of British Rola, Ltd. The petition was opposed by the shareholders.

Counsel stated that the parties had agreed to an order. The petitioning creditors had decided to issue a notice for a resolution for a voluntary liquidation. If that was carried counsel would have obtained what he wanted to achieve, to put the company in liquidation.

His Lordship said the matter would stand over for the terms to be carried out.

Receiver Appointed

In our last issue we reported that the directors of the Hopkinson Electric Co., Ltd., had requested their bankers to appoint a receiver and manager pending negotiations for a reorganization which are in hand and which it is hoped will enable the new factory at Cardiff to be fully developed. We are now informed that Mr. J. Adamson, of McClelland Ker & Co., has been appointed receiver.

Bankruptcies

L. O'Connor, trading as Paragon Electrical, 27, Wellington Square, London, S.W.3, electrical and radio contractor—Receiving order made 7th September on a creditor's petition.

C. A. Whittington, carrying on business at 400, Abbeydale Road, Sheffield, electrician and wireless dealer.—Supplemental dividend of 2s 3⅛d in the £, payable 22nd September at the Official Receiver's office, 55, Queen Street, Sheffield.

W. J. Griffin, radio and electrical dealer, carrying on business at 2, Hinckley Road, Earl Shilton, Leics.—Last day for receiving proofs, 30th September. Trustee, Mr. E. E. V. Rowley, 7, St. Martin's East, Leicester.

FINANCIAL SECTION
STOCKS and SHARES

STOCK Exchange markets, after being lashed into excitement in the early part ot the week, settled down to a calmer state of affairs when the first rush of devaluation business was over. The initial effect was to cause a general fall in the prices of all fixed-interest and fixed-dividend securities. The list of British Government stocks gave way to the extent of 1½ to 2 points all round. British Transport Threes fell to 90¾ and British Electric Threes, 1968-73, to 93½, the longer-dated issue being a point lower than this. Mild recovery followed the first depression, a few buyers being tempted by the cheap-looking appearance after the fall in the prices. Preference shares of most kinds, good, bad and indifferent, are out of favour as a corollary to the weakness of the gilt-edged stocks. Ordinary shares, particularly those of the popular industrials, were put up.

Price Fluctuations

These are some of the changes, taken at random, which have occurred since a week ago, but it is necessary to add that throughout the industrial markets rises were common to the shares in which there is anything like a free market.

Ordinary Share	August 20th	Rise on Week
	s d	s d
Associated Elec.	77 6	3 0
Crompton	26 0	1 6
Elec. Cons.	50 0	6
English Elec.	47 9	2 0
General Elec.	82 0	2 6
C. A. Parsons	66 3	3 9
Walsall Conduits	57 0	9
Westinghouse	64 0	2 0

British Electric Traction deferred at 168o is 45 points to the good on the week, Cable & Wireless ordinary at 236 being no more than a point up.

Telephone Shares

The highest yield on any of the shares in our monthly list of prices was offered, at the end of August, by Telephone Properties £1 ordinary, which could have been bought at about 9s 6d, affording a yield of 12 guineas per cent. The company has declared the usual dividend of 6 per cent, with rather unexpectedly good figures, on the strength of which the price moved up to 13s 3d. The yield, at 13s 3d, is still a substantial £9 1s 2d per cent. Anglo-Portuguese Telephones rose 1s 9d to 25s 9d on the issue of the report. This shows that the company has still a long list of intending subscribers, which, in itself, gives evidence of the maintenance of the company's prosperity. The Telephone & General Trust has increased its loan to the Anglo-Portuguese Telephone Co. by £382,000, raising the total to £788,000, which is suggestive of a probable issue of new capital sooner or later.

Automatic Telephone & Electric

On September 30th the Automatic Telephone & Electric Company will be posting to its shareholders details of an offer of new capital. This will take the shape of 315,621 ordinary shares of £1 each, and will be offered to shareholders at 50s per share—three new shares for each £10 of ordinary or deferred stock held. The present market price of the shares is about 57s.

Telegraph Construction Yield

Opinions differ about the yield basis on which Telegraph Construction & Maintenance ordinary should be valued now that the 25 per cent share bonus has been distributed. The last full year's dividend was 10 per cent on a capital of £782,000. A similar distribution, in money, on the £977,000 capital now in issue, would bring the rate down proportionately to 8 per cent. On strictly conservative lines, the market works out the yield on the latter rate, making it £3 14s 6d per cent at 43s ex bonus. The return is modest enough to indicate a belief in the maintenance of a 10 per cent rate, which would make the yield £4 13s per cent. Last profits represented over 35 per cent on the old capital.

Thorn Electrical

At the meeting of Thorn Electrical Industries last week, the chairman, Mr. Jules Thorn, declared that the boom is over, the sellers' market has gone. Uncertainties lie ahead and in the circumstances the Board considered it advisable to reduce the dividend from 25 per cent to 20 per cent. He spoke cheerfully of the progress of the company in the lighting industry and declared that the company was well placed to face the future with confidence.

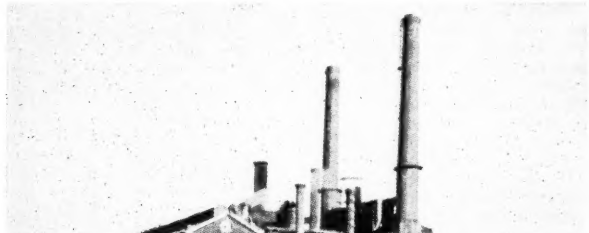
Christy Bros. Report

The first accounts of Christy Brothers (Chelmsford) showed a satisfactory beginning, with profits above expectations and a 5 per cent dividend which gives a return of £4 14s per cent on the £1 ordinary at 21s 3d. East African Power & Light continues the run of 7 per cent dividends on capital which has been more than doubled over the past decade. The shares stand at 40s 9d, the yield of £3 8s per cent showing how long-term prospects are assessed.

South African Power Plans

LARGE GENERATING PLANT ADDITIONS

TO meet the increasing demand from all classes of consumers—mining, industrial, traction, domestic and rural—the South African Electricity Supply Commission has in hand a heavy programme of generating plant and transmission line construction. In its report for 1948, which includes a brief review of its activities up to the end of April last, the Commission says that, so far as can be foreseen, expansion in the future is likely to be more rapid even than in the past.



Congella (Durban) power station showing new 300ft chimneys. A further 40 MW set was installed last year and another is scheduled for the current year

In particular, the opening of five new gold mines in the Orange Free State (others are also projected) in the Rand undertaking, set up last year to take over the system of the Victoria Falls and Transvaal Power Co., Ltd., is making large additional calls on the Commission. Orders have been placed for 146 MW of plant for the Vaal station and 20 MW for Witbank, while extensions are also being carried out at the Orlando station of Johannesburg Municipality. In addition, the Commission is endeavouring to advance the scheduled programme for a new 200 MW station at Vierfontein, and is planning to construct simultaneously with this station another of 100-150 MW eventual capacity.

Other projects envisaged by the Commission are a new 180 MW station adjoining the existing Salt River plant (Cape system); one—ultimately 240 MW—at Umgeni (Durban); a base-load station at Port Elizabeth, to operate in conjunction with the existing station; and another at East London (Border undertaking). Major extensions are also being proceeded with at Congella (Durban), Colenso (Natal) and Hex River (formerly known as Worcester station, Cape Town system). Altogether, plant actually in course of installation or on order amounts to 487 MW, which will raise the aggregate capacity of the Commission's power stations to 1,948 MW, but this covers only a part of the planned developments.

The extent of the Commission's transmission line programme may be judged from the fact that in the Rand undertaking alone approximately 1,000 miles of 40, 88 and 132 kV lines are scheduled for completion within the next three years, a figure equivalent to nearly 60 per cent of the total mileage of such lines at the date of transfer last year. Delays in the delivery of insulators from overseas have now been largely overcome, but the shortage of steel plate continues.

Of the 6,107 million kWh generated during 1948 (15.2 per cent increase) 2,565 million was produced at Klip, where the maximum hourly demand was 378,180 kW; station load factor 72.2 per cent; coal burned per kWh sent out, 1.923 lb (c.v. 8,900 B.Th.U.); and overall thermal efficiency 19.94 per cent. The highest efficiency was achieved at Vaal where 921 million kWh was generated, the coal consumption being 1.597 lb (c.v. 9,490 B.Th.U.) per kWh sent out and the overall thermal efficiency 22.51 per cent.

Sales of electricity in 1948 amounted to 5,576.9 million kWh, of which 2,693.5 million was supplied in bulk. Comparisons with the previous year are invalidated by the Victoria Falls acquisition. This is also the case with the financial results, in which the revenue of £6,492,153 represents an increase of 42 per cent on the previous year. Total production costs were £6,425,105, leaving a balance of £67,048. The average cost per kWh sold works out at 0.2609d and the revenue at 0.2636d.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1943

13561. Stevens, A. H. (Submarine Signal Co.).—Transmission and reception of beams of compressional waves in and near the supersonic range in a liquid medium. 19th August, 1943. (Convention date not granted.) (628524.)

1945

2088. Standard Telephones & Cables, Ltd.—Automatic telephone systems. 21st April, 1944. (628528.)

4564. British Thomson-Houston Co., Ltd.—Methods of and apparatus for manufacturing flash lamps. 26th February, 1944. (628529.)

14709. Philco Radio & Television Corporation.—Pulse oscillation generator. 11th May, 1944. (628532.)

18537. Telephone Manufacturing Co., Ltd., and Brockies, A. C.—Re-setting devices for electrical indicators or annunciators. 19th July, 1945. (628736.)

19073. Landis & Gyr Soc. Anon.—Electric contactor controlled by counting or summing apparatus. 29th July, 1944. (628534.)

19953. British Thomson-Houston Co., Ltd.—Bases for electric lamps. 10th August, 1944. (628535.)

22987. Modern Industries (London), Ltd., and Viney, H. S.—Electric fires. 6th September, 1945. (628462.)

23620. Advance Components, Ltd., and Hatfield, R. H.—Radio-frequency attenuators. 13th September, 1945. (628737.)

24874. Titanium Alloy Manufacturing Co.—Dielectric compositions. 10th April, 1943. (628536.)

28899. Pye, Ltd., and Jackson, D.—Suspension mounting for the magnetic focusing device of a cathode-ray tube. 31st October, 1945. (628541.)

1946

5812. Benjamin Electric, Ltd.—Housings for lighting equipment. 23rd February, 1945. (628739.)

7188. Pye, Ltd., and Edwards, B. J.—Picture projection tube particularly for television. 7th March, 1946. (628543.)

7503. Bendix Aviation Corporation.—Electric spark producing apparatus. 15th March, 1945. (628544.)

9447. Merles, A. J.—Systems making use of electronic tubes, especially for frequency changing. 21st July, 1945. (628740.)

10274. Philco Corporation. — Ultra-high-frequency electrical transmission systems. 31st October, 1944. (628547.)

13834. Compagnie Générale de Télégraphie sans Fil. —Devices intended for the transmitting of energy by means of a hollow electromagnetic guide. 7th May, 1942. (628551.)

14225. Cossor, Ltd., A. C., and Wynn, A. H. A.—Time base circuits. 10th May, 1946. (628742.)

14810. Standard Telephones & Cables, Ltd., and Mengel, G. P. de.—Thermionic valve generators. 16th May, 1946. (628553.)

16346. Electro-Norm Akt.-Ges.—Electricity meters. 28th February, 1946. (628743.)

17292. Philips Lamps. Ltd.—Signalling systems employing pulse-width modulation. 25th September, 1945. (62855.)

19391. Igranic Electric Co., Ltd.—Lifting magnets. 29th June, 1945. (628557.)

21014. Standard Telephones & Cables, Ltd.—Grid structures for electron-discharge devices. 3rd October, 1945. (628562.)

22005. Philips Lamps, Ltd.—Controllable dual electronic amplifiers. 3rd March, 1943. (628565.)

22108. Marconi's Wireless Telegraph Co., Ltd.—Television transmitter tube apparatus. 28th May, 1945. (628745.)

22323. Philips Lamps, Ltd.—Resistances having a negative temperature coefficient. 30th July, 1945. (628567.)

22797. Landis & Gyr Soc. Anon.—Means for effecting remote control by means of superposed electric currents differing in frequency from the network currents. 3rd August, 1945. (628568.)

24497. Standard Telephones & Cables, Ltd., and Starr, A. T.—Electric high-frequency oscillation generators. 16th August, 1946. (628570.)

24981. O'Brien, W. J.—Radio frequency transmitting apparatus. 27th August, 1945. (628747.)

26597. Igranic Electric Co., Ltd.—Electric timing systems. 4th September, 1945. (628575.)

26853. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Devices in which a trunnion or a shaft is secured to a plate. 23rd February, 1943. (628577.)

27475. Airmec Laboratories, Ltd., and Hulme, V. B. —Cathode-ray tube oscillograph apparatus. 12th September, 1946. (628579.)

29656. Standard Telephones & Cables, Ltd.—Antenna system. 19th June, 1945. (628584.)

29997. Igranic Electric Co., Ltd.—Systems for the control of polyphase electric motors. 8th October, 1945. (628749.)

30307. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Electro-mechanical transducers. 3rd February, 1943. (628587.)

30432. Triggs, W. W. (McAlister-Ross Corporation). —Vacuum cleaners. 11th October, 1946. (628588.)

30443. Decca Record Co., Ltd., and Huntley, W. P. —Measuring instruments. 11th October, 1946. (628482.)

30555. M-O Valve Co., Ltd., and Balls, A. W.—Magnetrons. 7th November, 1947. (628752.)

31240. Laboratories Radioelectriques.—Generator of pulses of radio-frequency radiation of high-pulse frequency. 24th October, 1945. (628595.)

31392. Western Electric Co., Inc.—Piezo-electric crystal elements and methods of making them. 31st October, 1945. (628597.)

32365. Cooke-Garborough, E. H.—Thermionic valve amplifiers. 31st October, 1946. (628601.)

32560. Shotter, G. F., and Hill, E. W.—Alternating-current electrical indicating instruments. 1st November, 1946. (628602.)

32917. Automatic Telephone & Electric Co., Ltd., and Baker, G. T.—Electrical signalling systems. 6th November, 1946. (628753.)

33350. Wilkinson, G. H.—Electrically heated drying devices. 9th November, 1946. (628604.)

34118. Radio Corporation of America.—Sound recording apparatus and method. 17th November, 1945. (Cognate application 34119/46.) (628606.)

34448. Triggs, W. W. (Crompton & Knowles Loom Works).—Electric weft detector for loom. 20th November, 1946. (628607.)

36458. British Thomson-Houston Co., Ltd., and Keitley, R.—Radio frequency heating of dielectrics. 10th December, 1946. (628612.)

37716. General Electric Co., Ltd., and Espley, D. C. —Measurement of phase distortion in electrical circuits. 23rd December, 1946. (628615.)

38009. Sylvania Electric Products, Inc.—Electric-discharge devices. 29th December, 1945. (628617.)

1947

2118. Ricardo, H. R., and Alcock, J. F.—Thermal power plants. 23rd January, 1947. (628759.)

2188. Ferguson Radio Corporation, Ltd., and Hodges, G. F.—Vacuum cleaners. 23rd January, 1947. (628632.)

2463. General Electric Co., Ltd., and Rowlands, R. O.—Wide-band electric filters. 27th January, 1947. (628634.)

2782. Hirst Electronic Development, Ltd., and Bramson, S. M.—Electric timing circuits using cold-cathode gas-discharge tubes. 29th January, 1947. (628635.)

3542. Soc. Industrielle des Procédés Loth.—Resonant bridge circuits for harmonic analysis. 7th January, 1943. (628637.)

4305. Standard Telephones & Cables, Ltd.—Frequency modulation system. 22nd February, 1946. (628641.)

5424. Humber, Ltd., and Mell, L. W.—Aerials for radio reception and/or transmission. 25th February, 1947. (628644.)

5642. Partridge, N. G.—Electron-discharge devices. 27th February, 1947. (628645.)

5818. Republic Steel Corporation.—Electric welder and a pressure head therefor. 15th December, 1944. (628646.)

6358. Herman, J. F.—Electric plug-and-socket couplings. 10th September, 1945. (628647.)

6653. Cinema-Television, Ltd., and Young, R. E.—Television or like systems. 10th March, 1947. (628648.)

6928. Allen, F. J.—Dynamo-electric machines. 12th March, 1947. (628763.)

9476. Venning & Co., Ltd., J., and Venning, J. D. E.—Fluid-pressure-operated electric switches. 9th April, 1947. (628652.)

9939. Landis & Gyr Soc. Anon.—Ring meter. 26th April, 1946. (628654.)

10856. Hirst Electronic Development, Ltd., and Bramson, S. M.—Electronic time switching apparatus. 23rd April, 1947. (628505.)

11234. Lewis, J. O., and Grant, A. K.—Electric soldering irons. 26th April, 1947. (628657.)

12194. Standard Telephones & Cables, Ltd., Deacon, H. J., and Foster, A. D.—Machines for cutting crystalline material. 6th May, 1947. (628508.)

12460. Westinghouse Electric International Co.—Core structures for electrical apparatus such as transformers. 10th May, 1946. (628511.)

16230. W. T. Henley's Telegraph Works Co., Ltd., Orchard, F. C., and Maxwell-Holroyd, S.—Apparatus for measuring prospective earth fault currents of electrical installations. 19th June, 1947. (628667.)

16250. Trico Products Corporation.—Electric tumbler switches. 26th June, 1946. (628518.)

19483. British Thomson-Houston Co., Ltd.—Radio pulse communication systems. 1st March, 1943. (628673.)

22020. Crompton Parkinson, Ltd.—Axle assemblies for rail vehicles. 29th November, 1940. (628681.)

22605. Standard Telephones & Cables, Ltd.—Electric multi-channel two-way pulse communication system. 24th August, 1946. (628683.)

24807. Dorman & Smith, Ltd., and Lund, J.—Shutter device for electric socket apparatus. 10th September, 1947. (628692.)

25279. Standard Telephones & Cables, Ltd., Fairley, F., Delamere, A. C., and Jarvis, F. L.—Connecting devices for coaxial cables. 16th September, 1947. (628696.)

25604. Hansen, K. E.—Gas-turbine plant. 19th September, 1947. (628697.)

25966. Autophon Akt.-Ges.—Mounting plates for electrical fittings. 7th March, 1946. (628698.)

26145. Westinghouse Electric International Co.—High-frequency oscillation generators. 7th October, 1946. (628769.)

26800. Reyrolle & Co., Ltd., A., and Amer, D. F.—Gas-blast electric circuit-breakers. 6th October, 1947. (628710.)

26897. English Electric Co., Ltd., and Caldbeck, C. J.—Braking of electrically propelled vehicles. 7th October, 1947. (628712.)

27027. Coughtrie, Ltd., J. & G., and Coughtrie, J.—Alternating-current solenoids. 8th October, 1947. (628715.)

27159. Gallay, Ltd., and Delaney, C. T.—Air heating devices. 9th October, 1947. (628720.)

27160. Gallay, Ltd., and Delaney, C. T.—Electric air heating devices. 9th October, 1947. (628721.)

27237. Westinghouse Brake & Signal Co., Ltd.—Alternating-current rectifiers of the dry surface contact type. 7th May, 1947. (628722.)

27244. Lucas, Ltd., J., and Whitehouse, R. J.—Tool for use in slitting electric cable covers. 10th October, 1947. (628724.)

27268. Reyrolle, & Co., Ltd., A., and Christie, J.—Liquid-insulated a.c. electric circuit-breakers. 10th October, 1947. (628728.)

27287. Franco-British Electrical Co., Ltd., Smith, C. E., and White, E. W.—Jet nozzles. 10th October, 1947. (628729.)

27395. Clark, H. V.—Supply and control of current to electric lamps. 13th October, 1947. (628775.)

27645. British Insulated Callender's Cables, Ltd., and Dixon, H. J.—Electric cables for high-frequency currents. 15th October, 1947. (628781.)

27698. Allmanna Svenska Elektriska Aktiebolaget.—Lightning arrestors. 21st March, 1939. (628791.)

27768. British Thomson-Houston Co., Ltd.—Electric incandescent lamps. 19th October, 1946. (628791.)

28003. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Circuits for generating an adjustable stable frequency. 3rd February, 1941. (628801.)

Trade Marks

APPLICATIONS have been made for the registration of the following trade marks. Objections may be entered within a month of 14th September.

ELECSTATIC. No. B673,233. Class 7. Electric vulcanizing apparatus and parts included in Class 7.—Romac Industries, Ltd., Romac Works, The Hyde, Hendon, London, N.W.9.

CHEETO. No. 677,989. Class 7. Electric food mixing machines.—John Perry & Co. (Plastics), Ltd., 105, Baker Street, London, W.1.

TEMCO. No. 660,889. Class 9. Wireless, television, telegraphic and telephonic instruments, alarm systems, electric current rectifiers, switches, plugs, sockets, junction boxes, measuring and indicating apparatus and time switches.—Telephone Manufacturing Co., Ltd., Hollingsworth Works, Martell Road, West Dulwich, London, S.E.21.

HIS MASTER'S VOICE (design). No. 674,716. Class 9. Electric cooking utensils included in Class 9, electric kettles, coffee percolators and temperature controlling apparatus, and parts of and fittings for all such goods, all included in Class 9.—The Gramophone Co., Ltd., Blyth Road, Hayes, Middx.

EVERDUR. No. 675,212. Class 9. Electric welding electrodes and electric welding apparatus.—Imperial Chemical Industries, Ltd., Wexham Road, Slough, Bucks.

INFRADYSER. No. 677,477. Class 10. Electric lamp and heating devices, all for curative purposes.—Civitas Trading Corporation, Ltd., 10, Portman Street, London, W.1.

MERLEX. No. 662,492. Class 11. Electrical apparatus included in Class 11 for lighting and heating purposes.—Truvox Engineering Co., Ltd., Truvox House, Exhibition Grounds, Wembley, Middx.

E.I.B.A. Birmingham Branch

THE Birmingham Branch of the Electrical Industries' Benevolent Association is reviving the dance and carnival which in pre-war days was one of the highlights of social activities in Birmingham, and it is hoped that a considerable sum of money will be raised. The dance will be held at the Magnet Club, Witton, Birmingham, on 7th October. Dress is informal and tickets (5s each) may be obtained from Mr. L. Wall, Electrical Components, Ltd., 102, Snow Hill, Birmingham, 4 (telephone: Central 3081, Ex. 5).

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Birmingham.—14th October. Estates Department. Electrical wiring of huts at Church Road Camp, Yardley. (16th September.)

Bournemouth.—7th October. Corporation. 150 street lighting columns. (See this issue.)

Castle Ward (Northumberland).—R.D.C. Electrical installations in 100 houses at Dinnington Village. Surveyor, North Road, Ponteland.

Coventry.—5th October. Housing Committee. Electrical installations in 126 houses. (16th September.)

Education Committee. Electrical contractors are invited to apply for their names to be included on the list selected to tender for various works in the new schools programme. (See this issue.)

Egypt.—CAIRO.—25th October. Electricity and Gas Administration. Electric cable. (16th September.)

Hornsey.—1st October. Town Council. Supply of columns, brackets and fittings in Archway Road and Aylmer Road. (16th September.)

Ince-in-Makerfield.—1st October. U.D.C. Electrical installations in 60 houses, Petticoat Lane site. R. Lewis, surveyor, Town Hall, Ince, near Wigan.

India.—Machkund Hydro-electric Scheme (first stage). The closing date for the receipt of tenders has been extended from 24th October to 30th November. (C.R.E. (I.B.) 23552/49. Ten/637A/I.B.1.)*

Lancashire.—County Council. Electrical installation at Penwortham Secondary School. (16th September.)

London.—WANDSWORTH.—16th November. Borough Council. Electrical installation and other work at the Council's Depot, Greaves Place, S.W.17. (16th September.)

Longbenton.—5th October. U.D.C. Street lighting installation, Dudley-Annitsford Road. (See this issue.)

Luton.—10th October. Borough Council. Supply, erection and wiring of street lighting columns. (See this issue.)

Marshland.—28th September. R.D.C. Installation of electricity services in 32 houses on six sites. S. G. Bailey, architect, Council Offices, Alexandra Road, Wisbech.

New Zealand.—WELLINGTON.—31st January. State Hydro-Electric Department. Four 3,333 kVA transformers. (C.R.E. (I.B.) 23791/49. Ten/618.)*

*Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.

Southampton.—20th October. Corporation. Electrical installation in Botley Road Infants' School. (See this issue.)

West Kent.—4th October. Main Sewerage Board. Electrical installation in fitters' shop at sewage purification works, Long Reach, Dartford. W. Howard, engineer to the Board, Barnfield, 20, Blyth Road, Bromley.

Orders Placed

Durham.—County Education Committee. Electrical work in schools: Dinsdale Park Residential School (£324).—Steel's Engineering Installations, Sunderland. West Auckland Copeland Lane Modern School (£798).—R. Robson, Willington. Crook New Modern School (£1,854).—Fletcher Bros., Newcastle.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Ashford (Kent).—Bacon curing factory on industrial estate; C. I. Epps and Sons, builders, 24, Station Road.

Bournemouth.—Transport garage, Castle Lane; Jackson & Greenen, architects, Hinton Buildings, Hinton Road.

Bovington.—Secondary school for Dorset E.C.; county architect, County Offices, Dorchester.

Brackley.—Four pumping stations and four sewage disposal works, for R.D.C.; Howard Humphreys and Sons, engineers, 17, Victoria Street, Westminster, S.W.1.

Bradford.—School at Clayton (£53,000); W. H. Leathem, town clerk, Town Hall.

Brandon.—Houses (20), London Road, for Mildenhall R.D.C.; D. C. Denton-Smith, architect, 40, Regent Street, Cambridge.

Brighton.—Flats (52), Sylvan Hall estate; borough engineer.

Bristol.—Works and offices, Brislington Trading Estate; John Wright & Sons, Ltd., 42, Triangle West.

Schools, Henleaze primary (£60,258), Petturton Road (£77,387) and Stoke Bishop primary (£41,550); city architect.

Reconstruction of Theatre Royal (£20,000); William Cowlin and Son, Ltd., Bristol.

Cardiff.—Rebuilding departmental stores; E. Roberts, Ltd., Kingsway.

Houses (361), Llanishen estate; city surveyor.

Chelmsford.—Extensions to works; Hoffman Manufacturing Co., Ltd., New Street.

Cheltenham.—Large extensions, Arle Court; Dowty Equipment, Ltd.

Chorley.—Houses (56), Tootell Street; borough engineer, Town Hall.

Coventry.—Extensions to Water Lane transport works; A. H. Gardner, architect, 11, Eaton Road.

Denton.—Houses (48), Lees House Farm site, schemes 4 & 5, for U.D.C.; surveyor, Town Hall.

Derby.—School, The Mount, Grange Avenue, Normanton; T. W. East, borough architect, The Council House.

Dudley.—Houses (50), Yew Tree Hill site; Wm. Lindley, Ltd., builders, Flood Street.

Dukinfield.—Houses (40), Yew Tree Lane site; Cruikshank & Seward, Princess Street, Manchester.

Edinburgh. — Workshops storerooms and offices, Westfield Avenue (£37,900); Westfield Autocar Co., Ltd.

Essex.—Health centres at Loughton Hall estate, Friday Hill (Chingford) and Grange Hill (Chigwell); H. Conolly, county architect, County Hall, Chelmsford.

Felton (Northumberland).—Houses (14), for Alnwick R.D.C.; Reavell & Cahill, Lloyds Bank Chambers, Alnwick.

Glasgow.—Primary schools, Toryglen; R. J. Walker & Smith, architects, 108, Douglas Street.

Grantham.—Houses (62), Harrowby Lane; W. Foster & Sons, builders.

Hanley (Staffs.).—Rebuilding Theatre Royal; G. L. Greaves, architect, 45, Trinity Street, Hanley, Stoke-on-Trent.

Ilfracombe.—Dwellings (28), Belmont Road estate; U.D.C. surveyor.

Lancashire.—Nursery schools at Springhill, Accrington (£14,500) and Haslingden (£15,500); G. Noel Hill, F.R.I.B.A., county architect, Preston.

Leicester.—Halls of residence at University College (£206,000); W. Moss and Sons, Ltd., builders, Loughborough.

Lichfield.—Dairy, garage, etc., Birmingham Road; Crownest Dairies, Ltd., The Friary.

Liverpool.—Restoration scheme for Walker Art Gallery (£70,000); city architect.

London.—ST. PANCRAS.—Dwellings, Judd Street, for St. Pancras B.C.; Denis Clarke Hall, architect, 6, Mason's Yard, Duke Street, S.W.1.

STRAND.—Office block, Adelphi; Collcutt & Hamp, architects, 126, Wigmore Street, W.1.

SOUTHFIELDS.—Flats (36), Strathville Road, for Wandsworth B.C.; borough architect.

London Colney.—Houses (20), Sheephouse Farm estate; Colney Housing Society, 40, Claremont Road, London, N.W.2.

Macclesfield.—Houses (58), Over Alderley, Chorley, Great Warford and Eaton, for R.D.C.; H. Chadwick, surveyor, 19, King Edward Street.

Manchester.—Houses for T.C. at Moss Nook; A. Wallwork, 25, Granby Road, Stretford (20); Marsden & Chapman, Bedford Drive, Timperley (58); J. C. Darley, Ltd., 2a, Brewerton Street, Manchester (21); Poole & Foster, Ltd., 49, Plymouth Avenue, Manchester (25); W. G. West, Ltd., Stockport (44); and 220 by direct labour.

Shops (24) and maisonettes, Greenbrow Road, Newall Green main centre; city architect, Town Hall.

Much Wenlock.—Secondary school, for Salop E.C.; A. G. Chant, county architect, Column House, London Road, Shrewsbury.

Newcastle-on-Tyne.—Extensions to confectionery factory and canteen for A. Wilkin, Ltd., Newcastle; R. W. Bell & Co., New Mills, Barrack Road, Newcastle.

Offices in Shields Road for Stewart and Lloyds, tube manufacturers; L. J. Couves & Partners, Carliol House, Newcastle.

Garage, Brinkburn Street, for Blakes Express Services, Ltd.; Bowey & Sons, builders, Back Raby Street, Newcastle.

Newmarket.—Dwellings (58), on eight sites, for R.D.C.; L. I. Cockerham, architect, Council Offices, Park Lane.

Nottingham.—Primary schools, Elm Avenue and Oxclose Lane; R. M. Finch, city engineer, Guildhall.

Oldbury.—Primary school, Causeway Green, Langley; county architect, 60, The Tything, Worcester.

Ottery St. Mary.—Adaptations at The Priory, for sectional headquarters and police quarters; H. V. de Courcy Hague, county architect. 97, Heavitree Road, Exeter.

Oxford.—Staff cottages (£20,000), Littlemore Hospital; Oxford Regional Hospital Board, 16, King Edward Street.

Peterborough.—Infants' school, Eye; J. G. Warwick, architect, 43a, Priestgate.

Plymouth. — Departmental stores, Royal Parade; E. Dingle and Co., Ltd., 8, The Esplanade.

Prescot.—Junior school for Lancs C.C.; Henry Boot & Sons, Ltd., Litherland.

Rainford.—Houses (40), Bank Villas site, for U.D.C.; Hunt Bros., Kirkham.

Redcar.—Houses (40), Dales Road estate; W. A. King & Son, builders. North Ormesby, Middlesbrough.

Ruislip.—Offices at Keyline House, for British European Airways; E. A. Roome & Co., Ltd., builders, 7, Urswick Road, E.9.

Scunthorpe.—Police buildings and magistrates' court, Station Road (£140,000); borough surveyor, Municipal Offices, 34, High Street.

Sheffield.—Extensions to market at Castle Hill (£480,000); city architect, Town Hall.

Southport.—Residential hostel for aged persons, Marshside Road; borough engineer.

Flats (61), Leicester Street and Albert Road; Hatch & Fielding, 341, Lord Street.

Stretford.—Police houses (38), on four sites; G. Noel Hill, county architect, Fishergate Hill, Preston.

Sunbury-on-Thames.—Houses (25), Vicarage Road; staff surveyor, Metropolitan Water Board, New River Head, Rosebery Avenue, E.C.1.

Sunderland.—Rebuilding Atlas Cabinet Works at Monkwearmouth; F. J. Hepple, Dunn Street, Newcastle-on-Tyne.

New factory at Pallion for the Northern Glass & Instrument Co.; H. E. Pitt, Leopold Street, Millfield, Sunderland.

Torquay.—County primary school, Watcombe, for Devon E.C.; county architect, 97, Heavitree Road, Exeter.

Tunbridge Wells.—Dwellings (58), Ramsley estate; borough surveyor.

Wimborne.—Houses (24), Sturminster Marshall; R.D.C. surveyor.

Wincanton.—Houses (10) and flats (1), Balsam Fields estate, for R.D.C.; R. Earnshaw, architect, Council Offices.